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Noise Impact Assessment undertaken by:

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NOISE IMPACT ASSESSMENT FOR

PETER ERNEST HOMES HOLDINGS LTD

87 REDWIG ROAD

WATERLOOVILLE

HAMPSHIRE

PO8 0LX

SITE ADDRESS

PROPOSED 10 BED COLIVING, 4 X STUDIO FLATS & COMMERCIAL SCHEME

270 LONDON ROAD

WATERLOOVILLE

HAMPSHIRE

ASSESSMENT DATE: 18TH – 19TH OCTOBER 2025

REPORT DATE: 22ND OCTOBER 2025

Acoustic Engineer:

Testing Date: 18th – 19th October 2025

Michael Vine



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Customer Name:

Testing Date: 18th – 19th October 2025

Report Date: 22nd October 2025

Peter Ernest Homes Holdings Ltd
87 Redwig Road
Waterlooville
Hampshire

Site Address:

270 London Road
Waterlooville
Hampshire
PO7 7ER

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 31st October 2025

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: 270 London Road, Waterlooville, Hampshire

Proposal: Conversion of current commercial building into 4 x studio flats and 10 bedrooms for co-living, with the boxing gym remaining on the ground floor.

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 of the proposed development site, to the front of proposed scheme facing London Road. The assessment took place between 1003hrs on Saturday 18th to 1003hrs on Sunday 19th October 2025, as this is the time the gym was not in operation.

The unattended assessment took measurements from the noise associated with London Road (Bus route & commercial street) at the front.

Additional assessments will be conducted for internal noise levels. This Noise Impact Assessment is only concerned with the external noise at the front of the development, in particular the buses using London Road along with patrons.



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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.*



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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 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)



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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 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



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Executive Summary:

Vine Acoustics Ltd were instructed by Peter Ernest Homes Holdings Ltd to undertake a Noise Impact Assessment (NIA) at 270 London Road, Waterloooville. A planning application is to be made to convert the existing building into a 10-x bedroom co-living space with 4 x studio flats and the commercial unit (boxing gym) remaining at ground floor level. The microphone location was used to determine the impact of the following noise sources on the proposed dwellings:

1. Noise associated with London Road – Front façade (Northwest)

This report will address the noise source 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 the front facade at 1st & 2nd floor. There are further bedrooms located to the rear, but these will be screened from the road noise and ventilated by singular MVHR ventilation systems. The noise sensitive rooms on the front elevation will be fitted with acoustic trickle vents. The proposed scheme 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 single room MVHR units to the rear and 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 low to moderate impact on 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 the same level of mitigation is proposed, 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 & commercial activity located to the front of the scheme and a small car parking area at the rear.

There are existing residential dwellings located in similar locations to the proposed, above the other commercial units.



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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 – single room MVHR units to rear and acoustic trickle vents to the front
- 4 Orientation of noise sensitive rooms – some bedrooms located to the rear
- 5 Installation of a Noise Limiter to the gym – set at 70dBA

The initial risk assessment has indicated that the day time noise levels for the proposed scheme fall into the low category at the front and negligible category at the rear and the night time levels fall into the low category at the front and will be negligible at the rear (due to screening and location). Pro PG states that for low categories *'at low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development'*.

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.

The levels listed below are the required criteria as is the case in such residential schemes.

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



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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 10-x bedroom co-living space and 4 x studio flats. The singular bedrooms will be located at 1st & 2nd floor at the rear, the 4 x studio flats located at the front, and the commercial unit (gym) remaining at the ground floor.

1.2 This report will account for noise emissions produced from London Road at the front. 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 commercial street and bus route in the centre of Waterlooville, Hampshire. The proposed building is located in a terrace of mixed-use buildings located immediately to the Southeast of London Road with the front elevation facing the street. The building is a commercial building and is built over three floors.

3.2 The buildings are predominantly mixed-use with a large number of commercial buildings with residential located above them in the immediate area. London Road is not open to cars but is the main bus route through Waterlooville. The local road network and car park are located further from the site.

3.3 The proposed scheme will comprise of a mixed-use scheme with the boxing gym located at the front & rear on the ground floor, the residential kitchen & lounge and bin stores also at the rear. Bedrooms 1-4 are located at 1st floor, facing the rear and bedroom 5 located in the middle of the building. 2 x Studio flats will be located at 1st floor, facing London Road. Bedrooms 6-9 will be located at 2nd floor facing the rear, with bedroom 10 located in the middle of the building and a further 2 x studio flats located at the front at 2nd floor, so it is clear to see that orientation of the bedrooms has been considered to reduce noise break in and offer a quieter façade for these rooms.

3.4 The measurement microphone was 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.

4 Weather Conditions:

4.1 The weather was warm & dry during the measurement procedure; the temperature ranged between 11-15 degrees on Saturday 18th and 14-16 degrees on Sunday 19th October. There were light clouds and some rain showers once the measurement period had finished.

5 Measurement Duration:

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



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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	LAeq 16hour Value	Reduction needed for BS8233 compliance	LAeq 8hour Value	Reduction for BS8233 compliance	L _{Amax} Value	Reduction for compliance
ML 1 – Front elevation	56dBA	21dB	45dBA	15dB	69dBA	24dB

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 low category of the Pro PG document for the front façade and the low to negligible 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. Based on the LAeq values, the rear rooms should be able to have their windows open throughout the 24hour without leading to an adverse impact.

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	56dBA	30dB	26dBA	Yes
Bedroom – LAeq	45dBA	30dB	15dBA	Yes
Bedroom - LAmax	69dBA	30dB	39dBA	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 LAeq 16hour and 35dBA LAeq 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 the development for the day time levels and the night time levels.



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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:

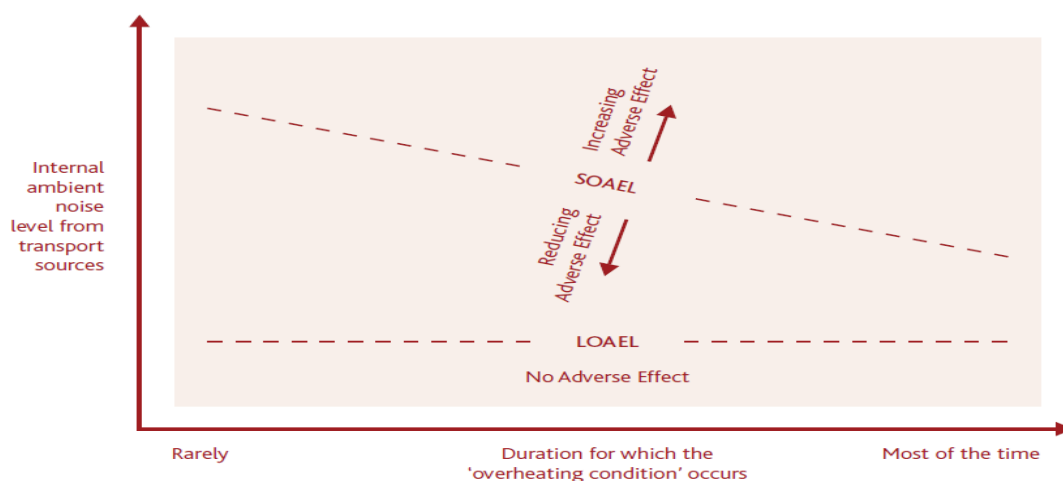
<i>Internal ambient noise levels</i>		
<i>L_{Aeq} 16hour 0700-2300</i>	<i>L_{Aeq} 8hour 2300-0700</i>	<i>Individual noise events 2300-0700</i>
>50dB	>42dB	Normally exceeds 65dB L _{Amax} T

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 Facade</i>	<i>External Level</i>	<i>Sound Reduction of open windows</i>	<i>Internal Level</i>
<i>Lounge</i>	56dBA	-13dB	43dBA
<i>Bedroom – L_{Aeq}</i>	45dBA	-13dB	32dBA
<i>Bedroom – L_{Amax}</i>	69dBA	-13dB	56dBA

<i>Rear Facade</i>	<i>External Level</i>	<i>Reduction offered by screening</i>	<i>Sound Reduction of open windows</i>	<i>Internal Level</i>
<i>Lounge</i>	56dBA	-15dB	-13dB	28dBA
<i>Bedroom – L_{Aeq}</i>	45dBA	-15dB	-13dB	17dBA
<i>Bedroom – L_{Amax}</i>	69dBA	-15dB	-13dB	41dBA

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 (front) and longer periods (at the rear), 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.



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7.9 It can be seen (using the measured levels) that the internal levels, are all calculated to be within the values listed in Table 3.3 with windows open and therefore illustrating that the noise ingress should not lead to a change in behavior. 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 dwelling 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 There is to be a small courtyard at ground floor level, towards the middle of the building. This will be completely screened from all noise sources and thus the calculated levels would be below the upper limit for amenity space as listed in BS8233: 2014. Therefore, the residents will not be adversely affected by the noise sources when using the amenity space located to the rear of the scheme.



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8 Required Levels of Mitigation:

<i>Elevation</i>	Noise Source	Level of Sound Reduction
<i>Front Façade</i>	London Road	24dBA
<i>Rear Façade</i>	Rear – calculated	9dBA

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. The rear rooms will be fitted with a single room MVHR system but have the ability to open their windows as required.

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

Make	Model	Type
Dexa	HR+	Single room mechanical ventilation
Titon Direct	Sonair F+	Wall mounted acoustic Ventilation

9.3 The above systems allow 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
RW Simon EHAS trickle vent	38dB	41dB
RW Simon Acoustic FV trickle vent	32dB	40dB
RW Simon Acoustic SL trickle vent	33dB	39dB

If multiple vents are required, then the performance requirement shown above 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 26-30dBA has been determined from the various calculations (should exceed requirements) 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 4-12-6	22mm	23	22	26	46	45	45	34-4=30dB
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.



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10 Results Summary:

10.1 The findings of this survey indicate that the noise associated with the immediate site will not have an adverse impact on the proposed residential scheme, providing the necessary mitigation measures are applied to the site.

10.2 The results of the various detailed calculations indicate that the noise emissions associated with area and neighbouring venue will not lead to an adverse impact for the future residents.

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 – single room MVHR units to rear and acoustic trickle vents to the front
- 4 Orientation of noise sensitive rooms – some bedrooms located to the rear
- 5 Installation of a Noise Limiter to the gym – set at 70dBA

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 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 In simplistic terms the windows serving the residential element of the scheme need to achieve an overall sound reduction of no less than 30dB. The front windows will be fitted with acoustic trickle vents (examples in section 9 above and the rear co-living rooms will be fitted with singular MVHR units (as seen in section 9 above).



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SITE PLAN





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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



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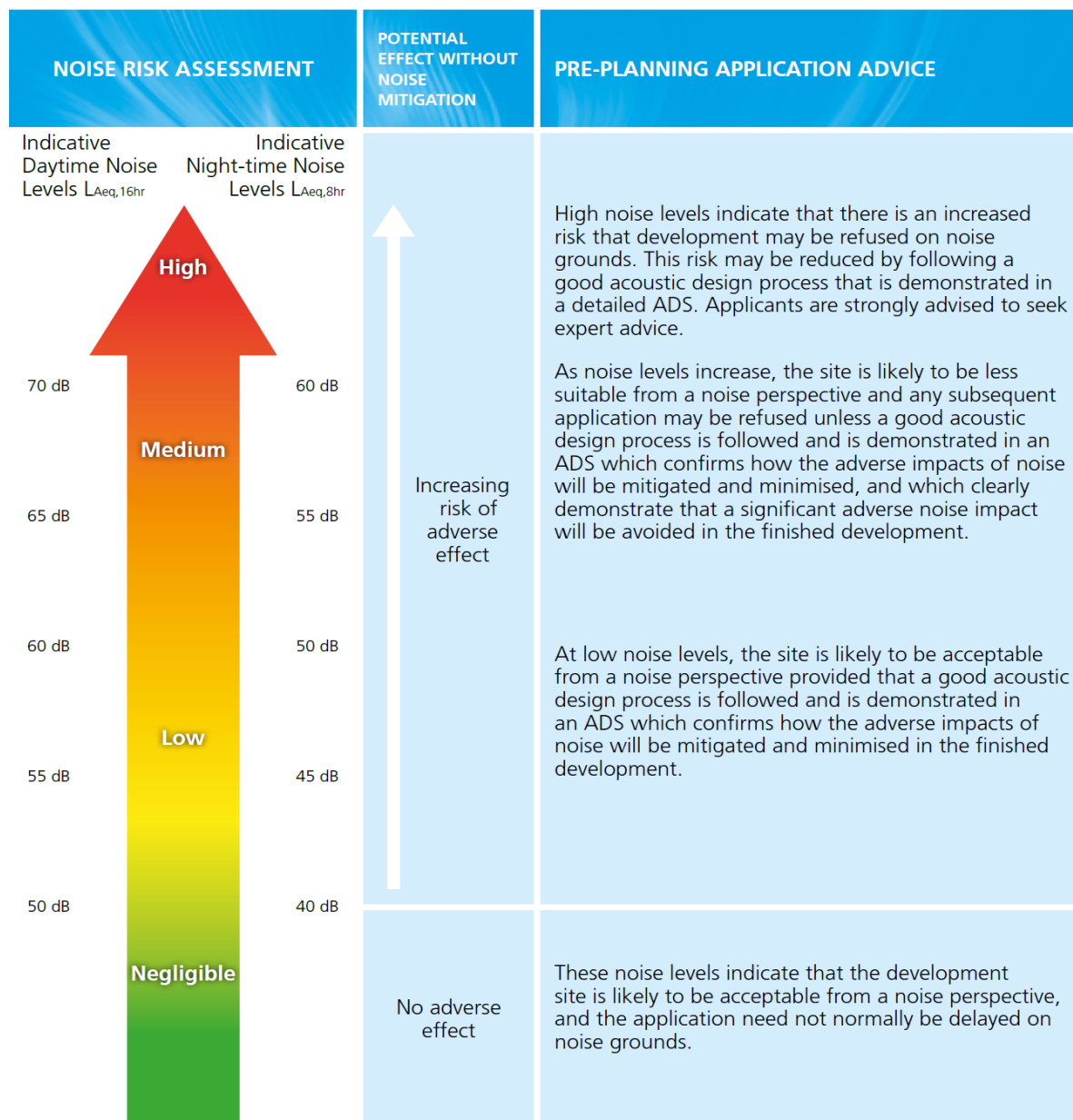


Figure 1 Notes:

- Indicative noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures.
- Indicative noise levels are the combined free-field noise level from all sources of transport noise and may also include industrial/commercial noise where this is present but is "not dominant".
- $L_{Aeq,16hr}$ is for daytime 0700 – 2300, $L_{Aeq,8hr}$ is for night-time 2300 – 0700.
- 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.

Figure 1. Stage 1– Initial Site Noise Risk Assessment



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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.

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:

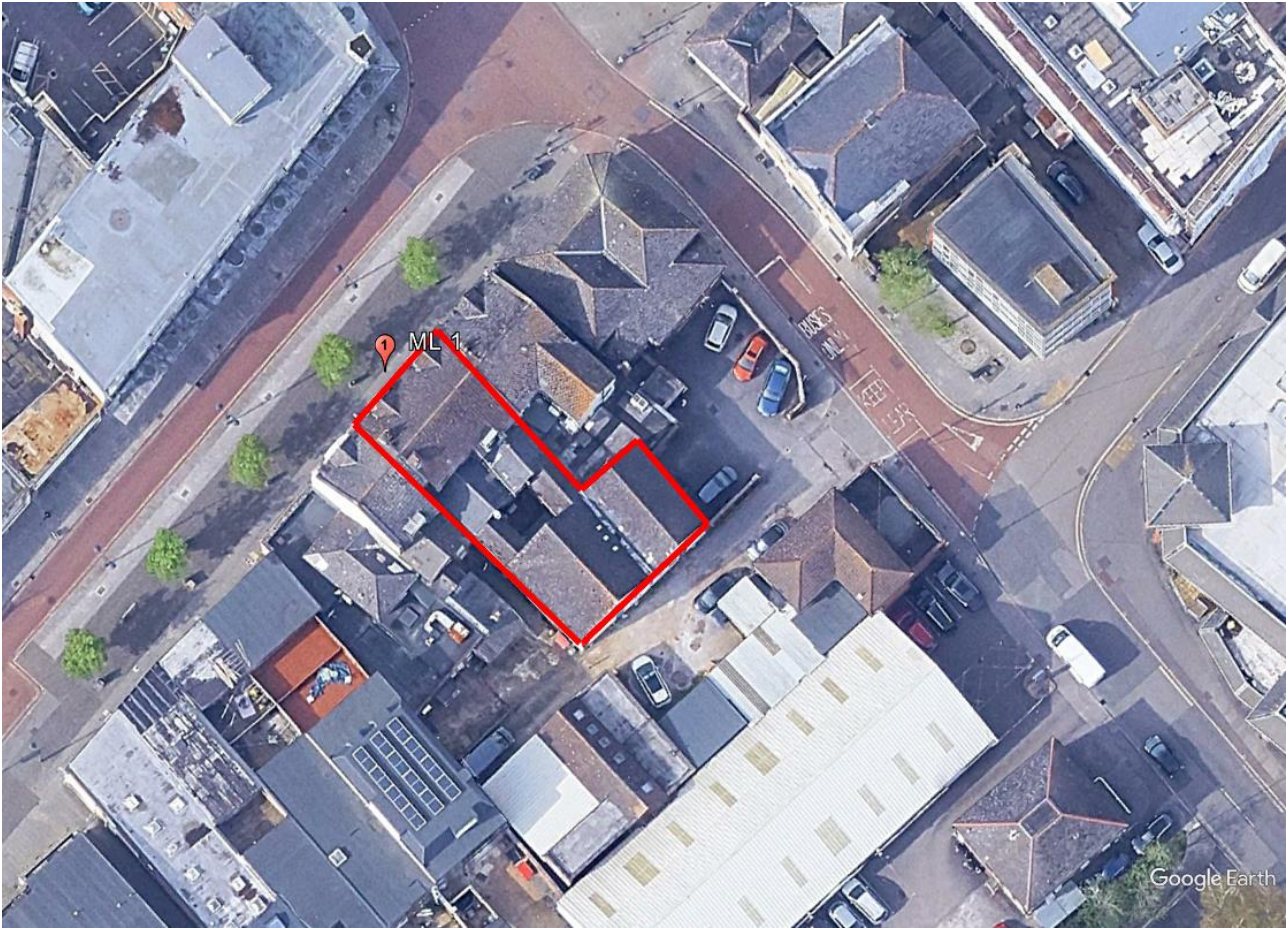
Code of Practice: BS8233: 2014 - Sound Insulation and noise reduction for buildings.

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

Pro PG — Planning & Noise, Residential Development — 2017



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ML 1

Time Period	LAeq	LAmx
(2025/10/18 10:03:02.00)	57.7	72.7
(2025/10/18 10:06:02.00)	57.5	78.5
(2025/10/18 10:09:02.00)	51.7	59.1
(2025/10/18 10:12:02.00)	54.8	73.1
(2025/10/18 10:15:02.00)	56.6	71.3
(2025/10/18 10:18:02.00)	57.8	75.4
(2025/10/18 10:21:02.00)	61.8	77.1
(2025/10/18 10:24:02.00)	61.5	75.1
(2025/10/18 10:27:02.00)	53.8	66.9
(2025/10/18 10:30:03.00)	57.4	76.5
(2025/10/18 10:33:02.00)	59.2	73.1
(2025/10/18 10:36:02.00)	54.7	72.4
(2025/10/18 10:39:02.00)	55.8	62.4
(2025/10/18 10:42:02.00)	57.9	73.9
(2025/10/18 10:45:02.00)	56.2	69.6
(2025/10/18 10:48:02.00)	57.4	73.4
(2025/10/18 10:51:02.00)	58.8	76.5
(2025/10/18 10:54:02.00)	56	67.6
(2025/10/18 10:57:02.00)	61.1	75.3
(2025/10/18 11:00:02.00)	58.2	72.6
(2025/10/18 11:03:02.00)	60.4	72.7
(2025/10/18 11:06:02.00)	58.1	75.9
(2025/10/18 11:09:02.00)	54.6	68.8
(2025/10/18 11:12:02.00)	52.7	61.4
(2025/10/18 11:15:02.00)	57.4	69.8
(2025/10/18 11:18:02.00)	59.1	78.3
(2025/10/18 11:21:02.00)	60.2	77.4
(2025/10/18 11:24:02.00)	57.2	72.3
(2025/10/18 11:27:02.00)	58	71.9
(2025/10/18 11:30:02.00)	57.5	72
(2025/10/18 11:33:02.00)	56.6	68.2
(2025/10/18 11:36:02.00)	61	76
(2025/10/18 11:39:02.00)	56.1	70.1
(2025/10/18 11:42:02.00)	53.4	70.7
(2025/10/18 11:45:02.00)	57.1	76.9
(2025/10/18 11:48:02.00)	55.1	71.8
(2025/10/18 11:51:02.00)	60.9	74.9
(2025/10/18 11:54:02.00)	60.9	78.2
(2025/10/18 11:57:02.00)	58.9	72.2
(2025/10/18 12:00:02.00)	61.2	76.2



(2025/10/18 12:03:02.00)	54.6	65.9
(2025/10/18 12:06:02.00)	61.7	79.4
(2025/10/18 12:09:02.00)	58.9	75.3
(2025/10/18 12:12:02.00)	53.8	69.7
(2025/10/18 12:15:02.00)	55.4	72.1
(2025/10/18 12:18:02.00)	61.6	74.5
(2025/10/18 12:21:02.00)	54.9	68.4
(2025/10/18 12:24:02.00)	59.5	77.3
(2025/10/18 12:27:03.00)	56.4	73.4
(2025/10/18 12:30:02.00)	54.6	75.1
(2025/10/18 12:33:02.00)	60.1	73.8
(2025/10/18 12:36:02.00)	59.2	76.6
(2025/10/18 12:39:02.00)	59.6	79.7
(2025/10/18 12:42:02.00)	53.1	61.5
(2025/10/18 12:45:02.00)	60.2	79.3
(2025/10/18 12:48:02.00)	59.3	78.7
(2025/10/18 12:51:02.00)	54.3	71.2
(2025/10/18 12:54:02.00)	57.6	72.9
(2025/10/18 12:57:02.00)	59.5	74.7
(2025/10/18 13:00:02.00)	59.2	77.2
(2025/10/18 13:03:02.00)	53.4	61.3
(2025/10/18 13:06:02.00)	58	73.3
(2025/10/18 13:09:02.00)	59.4	75.1
(2025/10/18 13:12:02.00)	52.9	63.8
(2025/10/18 13:15:02.00)	57.3	70.7
(2025/10/18 13:18:02.00)	58.2	74.9
(2025/10/18 13:21:02.00)	61.8	76.1
(2025/10/18 13:24:02.00)	56.5	72.4
(2025/10/18 13:27:02.00)	57.2	72.9
(2025/10/18 13:30:02.00)	54.8	65
(2025/10/18 13:33:02.00)	59.5	74.6
(2025/10/18 13:36:02.00)	58.9	77.4
(2025/10/18 13:39:02.00)	54.3	63.3
(2025/10/18 13:42:02.00)	54.6	62.4
(2025/10/18 13:45:02.00)	55.2	66.8
(2025/10/18 13:48:02.00)	58.7	75.9
(2025/10/18 13:51:02.00)	62.7	76.9
(2025/10/18 13:54:02.00)	56.4	72.2
(2025/10/18 13:57:02.00)	57.8	73
(2025/10/18 14:00:02.00)	58.9	74.1
(2025/10/18 14:03:02.00)	53.6	68.3
(2025/10/18 14:06:02.00)	54.6	71.2
(2025/10/18 14:09:02.00)	56.8	76
(2025/10/18 14:12:02.00)	54.9	70.4
(2025/10/18 14:15:02.00)	60.2	72.4



(2025/10/18 14:18:02.00)	58	73.1
(2025/10/18 14:21:02.00)	58	73.6
(2025/10/18 14:24:02.00)	62.4	76.1
(2025/10/18 14:27:02.00)	54.4	66.3
(2025/10/18 14:30:02.00)	57.9	70.9
(2025/10/18 14:33:02.00)	59.6	74
(2025/10/18 14:36:02.00)	55.3	67.9
(2025/10/18 14:39:02.00)	60.1	85.2
(2025/10/18 14:42:02.00)	53.4	72.9
(2025/10/18 14:45:02.00)	55.9	67.7
(2025/10/18 14:48:02.00)	58.8	76.2
(2025/10/18 14:51:02.00)	61.7	79.5
(2025/10/18 14:54:02.00)	54.2	70.2
(2025/10/18 14:57:02.00)	56.4	76.1
(2025/10/18 15:00:02.00)	56	72.3
(2025/10/18 15:03:02.00)	60.9	77.4
(2025/10/18 15:06:02.00)	52.9	67.9
(2025/10/18 15:09:02.00)	57.3	75.8
(2025/10/18 15:12:02.00)	54.5	71.5
(2025/10/18 15:15:02.00)	57.3	73.5
(2025/10/18 15:18:02.00)	61.1	78.5
(2025/10/18 15:21:02.00)	57.1	73.2
(2025/10/18 15:24:02.00)	57.9	73.6
(2025/10/18 15:27:02.00)	57.2	82.1
(2025/10/18 15:30:02.00)	59.8	78.4
(2025/10/18 15:33:02.00)	56.1	73
(2025/10/18 15:36:02.00)	58.6	75.1
(2025/10/18 15:39:02.00)	56	69.2
(2025/10/18 15:42:02.00)	57.3	75.1
(2025/10/18 15:45:02.00)	61.5	79.1
(2025/10/18 15:48:02.00)	57	69.3
(2025/10/18 15:51:02.00)	55.2	69.6
(2025/10/18 15:54:02.00)	58.7	75.8
(2025/10/18 15:57:02.00)	58.7	73.6
(2025/10/18 16:00:02.00)	58.8	77.9
(2025/10/18 16:03:02.00)	56.3	73.1
(2025/10/18 16:06:02.00)	59.1	74.5
(2025/10/18 16:09:03.00)	51.6	63.2
(2025/10/18 16:12:02.00)	54	71.8
(2025/10/18 16:15:02.00)	60.9	80.7
(2025/10/18 16:18:02.00)	57.7	69.5
(2025/10/18 16:21:02.00)	62.3	78.3
(2025/10/18 16:24:02.00)	52.1	69.3
(2025/10/18 16:27:02.00)	58.4	73.4



(2025/10/18 16:30:02.00)	58	73.7
(2025/10/18 16:33:02.00)	60.7	74.9
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(2025/10/18 16:48:02.00)	57.3	76.3
(2025/10/18 16:51:02.00)	56.3	69.4
(2025/10/18 16:54:02.00)	52.8	63
(2025/10/18 16:57:02.00)	58.4	74.2
(2025/10/18 17:00:02.00)	59.5	72.7
(2025/10/18 17:03:02.00)	53.3	65.4
(2025/10/18 17:06:02.00)	60.8	75.1
(2025/10/18 17:09:02.00)	54.8	70.3
(2025/10/18 17:12:02.00)	54.7	66.6
(2025/10/18 17:15:02.00)	58.7	75
(2025/10/18 17:18:02.00)	58.5	83.5
(2025/10/18 17:21:02.00)	60.1	77.1
(2025/10/18 17:24:02.00)	57.6	74.2
(2025/10/18 17:27:02.00)	52.6	60.4
(2025/10/18 17:30:02.00)	59.2	79.4
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(2025/10/18 18:27:02.00)	56	77
(2025/10/18 18:30:02.00)	54.3	73
(2025/10/18 18:33:02.00)	58.7	79.6
(2025/10/18 18:36:02.00)	55.8	69.8
(2025/10/18 18:39:02.00)	52.3	61.5
(2025/10/18 18:42:02.00)	56	76.5



(2025/10/18 18:45:02.00)	51.2	63.4
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(2025/10/18 18:51:02.00)	54.3	71.8
(2025/10/18 18:54:02.00)	53.5	61.9
(2025/10/18 18:57:02.00)	61.6	78.4
(2025/10/18 19:00:02.00)	56.8	80
(2025/10/18 19:03:02.00)	58.1	77.3
(2025/10/18 19:06:02.00)	56.4	69.6
(2025/10/18 19:09:02.00)	53.2	60.8
(2025/10/18 19:12:03.00)	51.9	63.9
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(2025/10/18 19:18:02.00)	56.7	72.1
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(2025/10/18 19:27:02.00)	57.2	76.2
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(2025/10/18 19:45:02.00)	50.1	59.2
(2025/10/18 19:48:02.00)	53.8	63.7
(2025/10/18 19:51:02.00)	53.8	67
(2025/10/18 19:54:02.00)	54.5	65.4
(2025/10/18 19:57:02.00)	61.1	77.4
(2025/10/18 20:00:03.00)	51.3	65.5
(2025/10/18 20:03:02.00)	56.9	76.8
(2025/10/18 20:06:02.00)	50.9	60.6
(2025/10/18 20:09:02.00)	50.7	63.3
(2025/10/18 20:12:02.00)	54.7	69.4
(2025/10/18 20:15:02.00)	56.2	73.4
(2025/10/18 20:18:02.00)	57.5	73.5
(2025/10/18 20:21:02.00)	54.4	63.1
(2025/10/18 20:24:02.00)	54	66.9
(2025/10/18 20:27:02.00)	50.5	56
(2025/10/18 20:30:02.00)	50.2	58.9
(2025/10/18 20:33:02.00)	58.1	79.8
(2025/10/18 20:36:02.00)	56.2	72.4
(2025/10/18 20:39:02.00)	50.7	66.9
(2025/10/18 20:42:02.00)	50.5	60.8
(2025/10/18 20:45:02.00)	55.3	71.5
(2025/10/18 20:48:02.00)	55.5	71.6
(2025/10/18 20:51:02.00)	52.9	66.8
(2025/10/18 20:54:02.00)	56.5	72.3



(2025/10/18 20:57:02.00)	52.8	68.8
(2025/10/18 21:00:02.00)	50.2	58.7
(2025/10/18 21:03:02.00)	52	66.1
(2025/10/18 21:06:02.00)	50.5	58
(2025/10/18 21:09:02.00)	57.2	82.7
(2025/10/18 21:12:02.00)	54.7	69.1
(2025/10/18 21:15:02.00)	56.4	71.5
(2025/10/18 21:18:02.00)	53.7	69.1
(2025/10/18 21:21:02.00)	49.2	60.8
(2025/10/18 21:24:02.00)	50.2	58.8
(2025/10/18 21:27:02.00)	56.4	72.6
(2025/10/18 21:30:02.00)	50.6	57.7
(2025/10/18 21:33:02.00)	58.6	80.1
(2025/10/18 21:36:02.00)	53	67.6
(2025/10/18 21:39:02.00)	48.3	55.9
(2025/10/18 21:42:02.00)	54.7	69.3
(2025/10/18 21:45:02.00)	56.8	71.5
(2025/10/18 21:48:02.00)	48.7	60.7
(2025/10/18 21:51:02.00)	51	60.9
(2025/10/18 21:54:02.00)	54.8	71.1
(2025/10/18 21:57:02.00)	49.3	57.6
(2025/10/18 22:00:02.00)	53.4	70.7
(2025/10/18 22:03:02.00)	58.2	75.2
(2025/10/18 22:06:02.00)	48.4	53.4
(2025/10/18 22:09:03.00)	48.6	57.8
(2025/10/18 22:12:02.00)	58.5	72.3
(2025/10/18 22:15:02.00)	51.1	60.4
(2025/10/18 22:18:02.00)	51.9	64.8
(2025/10/18 22:21:02.00)	51.3	62.8
(2025/10/18 22:24:02.00)	57.7	77.2
(2025/10/18 22:27:02.00)	48.8	63.8
(2025/10/18 22:30:02.00)	47.4	53.9
(2025/10/18 22:33:02.00)	49.2	59.2
(2025/10/18 22:36:03.00)	50.7	63.2
(2025/10/18 22:39:02.00)	48.8	60.7
(2025/10/18 22:42:02.00)	55.8	71.1
(2025/10/18 22:45:02.00)	53.8	70.5
(2025/10/18 22:48:02.00)	55.7	70.5
(2025/10/18 22:51:03.00)	56.7	77.5
(2025/10/18 22:54:02.00)	47.3	54.3
(2025/10/18 22:57:02.00)	47.6	53.7
(2025/10/18 23:00:02.00)	47.2	52.8
(2025/10/18 23:03:02.00)	47.3	52.8
(2025/10/18 23:06:02.00)	47.2	54.4
(2025/10/18 23:09:03.00)	54.2	70.6



(2025/10/18 23:12:02.00)	54.8	71.4
(2025/10/18 23:15:02.00)	51.1	61.9
(2025/10/18 23:18:02.00)	62	76.1
(2025/10/18 23:21:03.00)	47.6	62.6
(2025/10/18 23:24:02.00)	48.2	56.1
(2025/10/18 23:27:02.00)	49.9	61.6
(2025/10/18 23:30:02.00)	46.9	51.9
(2025/10/18 23:33:02.00)	46.8	50.8
(2025/10/18 23:36:02.00)	47	54.4
(2025/10/18 23:39:02.00)	48.3	60.1
(2025/10/18 23:42:02.00)	47.1	52.1
(2025/10/18 23:45:02.00)	56.5	72.4
(2025/10/18 23:48:02.00)	48.5	56
(2025/10/18 23:51:02.00)	57.4	74.9
(2025/10/18 23:54:02.00)	57.7	75.2
(2025/10/18 23:57:02.00)	47.5	59
(2025/10/19 00:00:03.00)	47.8	65.8
(2025/10/19 00:03:02.00)	47.1	56.4
(2025/10/19 00:06:02.00)	50.4	63.4
(2025/10/19 00:09:02.00)	48.3	60.9
(2025/10/19 00:12:02.00)	55.8	72.6
(2025/10/19 00:15:02.00)	55.8	73.9
(2025/10/19 00:18:02.00)	46.1	54.8
(2025/10/19 00:21:02.00)	44.6	55.9
(2025/10/19 00:24:02.00)	45.3	56.1
(2025/10/19 00:27:02.00)	45.5	52.9
(2025/10/19 00:30:02.00)	45.6	57.1
(2025/10/19 00:33:02.00)	48.6	61.2
(2025/10/19 00:36:02.00)	45.4	52.6
(2025/10/19 00:39:02.00)	45.9	56.6
(2025/10/19 00:42:02.00)	46.7	53.5
(2025/10/19 00:45:02.00)	50.1	58.9
(2025/10/19 00:48:02.00)	44.2	53.6
(2025/10/19 00:51:02.00)	46	57.9
(2025/10/19 00:54:03.00)	45.7	53.1
(2025/10/19 00:57:02.00)	44.5	51.4
(2025/10/19 01:00:02.00)	43	50
(2025/10/19 01:03:02.00)	43.6	50
(2025/10/19 01:06:02.00)	45.9	62.7
(2025/10/19 01:09:02.00)	43	49.6
(2025/10/19 01:12:02.00)	46	55.5
(2025/10/19 01:15:02.00)	44	50.8
(2025/10/19 01:18:02.00)	55.4	74.9
(2025/10/19 01:21:02.00)	43.3	53.9



(2025/10/19 01:24:02.00)	43.3	50.9
(2025/10/19 01:27:02.00)	42.1	48.2
(2025/10/19 01:30:02.00)	43.2	52.4
(2025/10/19 01:33:02.00)	43	53.9
(2025/10/19 01:36:02.00)	39.6	43.9
(2025/10/19 01:39:02.00)	42	47.6
(2025/10/19 01:42:02.00)	55.6	72.5
(2025/10/19 01:45:02.00)	42.4	52.5
(2025/10/19 01:48:02.00)	41	55.3
(2025/10/19 01:51:02.00)	44.7	59.8
(2025/10/19 01:54:02.00)	42.6	50.1
(2025/10/19 01:57:02.00)	43.4	50.1
(2025/10/19 02:00:02.00)	50.7	68.6
(2025/10/19 02:03:02.00)	42.3	53.9
(2025/10/19 02:06:02.00)	43.1	54.8
(2025/10/19 02:09:02.00)	41.9	53.8
(2025/10/19 02:12:02.00)	40.2	50.3
(2025/10/19 02:15:02.00)	39.9	52.4
(2025/10/19 02:18:02.00)	44.8	55.8
(2025/10/19 02:21:02.00)	42.1	49.7
(2025/10/19 02:24:02.00)	42.2	49.5
(2025/10/19 02:27:02.00)	42.8	51
(2025/10/19 02:30:02.00)	47.7	60.6
(2025/10/19 02:33:02.00)	40	47.4
(2025/10/19 02:36:02.00)	44.7	59.4
(2025/10/19 02:39:02.00)	41	47.7
(2025/10/19 02:42:02.00)	42.8	51.8
(2025/10/19 02:45:02.00)	42.4	49.4
(2025/10/19 02:48:02.00)	43.3	55.5
(2025/10/19 02:51:02.00)	40.2	49.4
(2025/10/19 02:54:02.00)	42.3	54.6
(2025/10/19 02:57:02.00)	41.9	46.7
(2025/10/19 03:00:02.00)	44.1	56.3
(2025/10/19 03:03:02.00)	40.4	47.1
(2025/10/19 03:06:02.00)	43	53.1
(2025/10/19 03:09:02.00)	40.5	46.4
(2025/10/19 03:12:02.00)	42.1	49.1
(2025/10/19 03:15:02.00)	45.3	60.4
(2025/10/19 03:18:02.00)	39.8	45.6
(2025/10/19 03:21:02.00)	42.5	52.1
(2025/10/19 03:24:02.00)	44	55.2
(2025/10/19 03:27:02.00)	40.5	51.3
(2025/10/19 03:30:02.00)	40.8	48.3
(2025/10/19 03:33:02.00)	45.8	56.8
(2025/10/19 03:36:02.00)	40	47.2



(2025/10/19 03:39:02.00)	38.7	42.4
(2025/10/19 03:42:02.00)	39.2	44
(2025/10/19 03:45:02.00)	41.9	49.5
(2025/10/19 03:48:02.00)	41.7	47.7
(2025/10/19 03:51:02.00)	42.7	49
(2025/10/19 03:54:02.00)	45.8	55.8
(2025/10/19 03:57:02.00)	40.6	49.6
(2025/10/19 04:00:02.00)	42.9	52.5
(2025/10/19 04:03:02.00)	40.9	46.8
(2025/10/19 04:06:02.00)	43.3	52.4
(2025/10/19 04:09:02.00)	43.5	57.4
(2025/10/19 04:12:02.00)	48.1	65.3
(2025/10/19 04:15:02.00)	42.9	52.5
(2025/10/19 04:18:02.00)	41.5	53.3
(2025/10/19 04:21:02.00)	41.8	50
(2025/10/19 04:24:02.00)	40.1	46.9
(2025/10/19 04:27:02.00)	40.3	49.7
(2025/10/19 04:30:02.00)	39.4	44.3
(2025/10/19 04:33:02.00)	39.8	46.1
(2025/10/19 04:36:02.00)	41.1	50
(2025/10/19 04:39:02.00)	41.8	50.6
(2025/10/19 04:42:02.00)	40.7	51.7
(2025/10/19 04:45:02.00)	40.6	47.7
(2025/10/19 04:48:02.00)	41	50.9
(2025/10/19 04:51:02.00)	41	50.9
(2025/10/19 04:54:02.00)	42.4	52.9
(2025/10/19 04:57:02.00)	43	52
(2025/10/19 05:00:02.00)	42.3	49.1
(2025/10/19 05:03:02.00)	41.6	47.3
(2025/10/19 05:06:02.00)	42.2	51.8
(2025/10/19 05:09:02.00)	42.2	53.2
(2025/10/19 05:12:02.00)	41.2	49.1
(2025/10/19 05:15:02.00)	42.6	49.1
(2025/10/19 05:18:02.00)	42.3	47.6
(2025/10/19 05:21:02.00)	41.1	48.3
(2025/10/19 05:24:02.00)	44.7	52.4
(2025/10/19 05:27:02.00)	42.7	48.1
(2025/10/19 05:30:02.00)	42.3	49.3
(2025/10/19 05:33:02.00)	43	49.6
(2025/10/19 05:36:02.00)	42.3	49.7
(2025/10/19 05:39:02.00)	45.4	57.3
(2025/10/19 05:42:02.00)	45.2	56.3
(2025/10/19 05:45:02.00)	45	58.2
(2025/10/19 05:48:02.00)	45.7	54.1



(2025/10/19 05:51:02.00)	44.6	51.8
(2025/10/19 05:54:02.00)	45.7	53.7
(2025/10/19 05:57:02.00)	44.9	56.4
(2025/10/19 06:00:02.00)	42.3	50.5
(2025/10/19 06:03:02.00)	41.6	52.1
(2025/10/19 06:06:02.00)	42.2	69.1
(2025/10/19 06:09:02.00)	42.2	48
(2025/10/19 06:12:02.00)	41.2	52.8
(2025/10/19 06:15:02.00)	42.6	47
(2025/10/19 06:18:02.00)	42.3	72.2
(2025/10/19 06:21:02.00)	41.1	51.4
(2025/10/19 06:24:02.00)	44.7	52.9
(2025/10/19 06:27:02.00)	42.7	53.3
(2025/10/19 06:30:02.00)	42.3	52.4
(2025/10/19 06:33:02.00)	43	62.1
(2025/10/19 06:36:02.00)	42.3	62
(2025/10/19 06:39:02.00)	45.4	63.7
(2025/10/19 06:42:02.00)	45.2	51.9
(2025/10/19 06:45:02.00)	45	60.2
(2025/10/19 06:48:02.00)	45.7	57.5
(2025/10/19 06:51:02.00)	44.6	68.3
(2025/10/19 06:54:02.00)	45.7	56.7
(2025/10/19 06:57:02.00)	44.9	55.1
(2025/10/19 07:00:02.00)	57.6	74.5
(2025/10/19 07:03:02.00)	45.7	51.6
(2025/10/19 07:06:02.00)	50	59.9
(2025/10/19 07:09:02.00)	48.3	58.7
(2025/10/19 07:12:02.00)	56.7	73.1
(2025/10/19 07:15:02.00)	46.7	52.4
(2025/10/19 07:18:02.00)	46.4	58.5
(2025/10/19 07:21:02.00)	45.4	55.5
(2025/10/19 07:24:02.00)	46.9	54.7
(2025/10/19 07:27:02.00)	57.9	71.3
(2025/10/19 07:30:02.00)	57.3	79.6
(2025/10/19 07:33:02.00)	51	67.4
(2025/10/19 07:36:02.00)	50.6	63.7
(2025/10/19 07:39:02.00)	57	71.7
(2025/10/19 07:42:02.00)	47.6	59.6
(2025/10/19 07:45:02.00)	48.7	61.3
(2025/10/19 07:48:02.00)	63.7	74.9
(2025/10/19 07:51:02.00)	65.4	75.7
(2025/10/19 07:54:02.00)	47.2	52.9
(2025/10/19 07:57:02.00)	57.7	74.1
(2025/10/19 08:00:02.00)	58.2	77.8
(2025/10/19 08:03:02.00)	49.8	63.8



(2025/10/19 08:06:02.00)	53.3	73.8
(2025/10/19 08:09:03.00)	53.8	69.3
(2025/10/19 08:12:02.00)	59.4	78
(2025/10/19 08:15:02.00)	56.3	72.9
(2025/10/19 08:18:02.00)	49	59.1
(2025/10/19 08:21:02.00)	48.8	57.7
(2025/10/19 08:24:02.00)	58.6	76.6
(2025/10/19 08:27:02.00)	52.2	68.7
(2025/10/19 08:30:02.00)	50.7	60.2
(2025/10/19 08:33:02.00)	57.6	75.5
(2025/10/19 08:36:02.00)	53.4	63.3
(2025/10/19 08:39:02.00)	53.7	67.9
(2025/10/19 08:42:03.00)	51.5	60.8
(2025/10/19 08:45:02.00)	59.7	75.7
(2025/10/19 08:48:02.00)	55.2	72.4
(2025/10/19 08:51:02.00)	54.5	69.2
(2025/10/19 08:54:02.00)	49.6	56.9
(2025/10/19 08:57:02.00)	57.1	72.2
(2025/10/19 09:00:02.00)	50.8	57.9
(2025/10/19 09:03:02.00)	59.1	79
(2025/10/19 09:06:02.00)	53.5	60.5
(2025/10/19 09:09:02.00)	52.9	64.5
(2025/10/19 09:12:02.00)	52.1	71.1
(2025/10/19 09:15:02.00)	59.6	75.1
(2025/10/19 09:18:02.00)	54.3	69.6
(2025/10/19 09:21:02.00)	56.6	71
(2025/10/19 09:24:02.00)	50.4	63.7
(2025/10/19 09:27:02.00)	54	67.5
(2025/10/19 09:30:02.00)	49.2	60.5
(2025/10/19 09:33:03.00)	58.1	79
(2025/10/19 09:36:02.00)	52	61.1
(2025/10/19 09:39:02.00)	73.9	81
(2025/10/19 09:42:02.00)	74.4	79.7
(2025/10/19 09:45:02.00)	73.7	79.5
(2025/10/19 09:48:02.00)	68.1	77.6
(2025/10/19 09:51:02.00)	63.4	75.6
(2025/10/19 09:54:02.00)	52.6	62.5
(2025/10/19 09:57:02.00)	62.3	77.9
(2025/10/19 10:00:02.00)	58.6	73.5

