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15 September 2025

20432-EBF-01-AA-R0

External Building Fabric Report

Project Number
20432

Issued For
Joe Lederberger

Company registered in England & Wales no. 07958744
UKAS accreditation is only applicable to pre-completion sound insulation testing services for building regulations and is not linked to the endorsements and certifications shown above

EXECUTIVE SUMMARY

This assessment has been undertaken so external building fabric elements can be specified in order to meet appropriate internal noise criteria at 169 Brighton Road, Worthing.

The assessment adheres to the Local Authority requirements, the principles provided by the *National Planning Policy Framework*: 2024 (NPPF) and internal noise criteria stated within BS 8233: 2014 *'Guidance on sound insulation and noise reduction for buildings'.*

The Institute of Acoustics' *Professional Guidance on Planning & Noise*: 2017 (ProPG) recommended approach for determining site risk due to environmental noise has also been adopted.

The site currently comprises a three-storey building with 3 No. Flats. Proposals include changes to the building layout to accommodate 5 No. residential flats.

A noise survey has been undertaken as detailed in the report, in order to establish the prevailing environmental noise levels at the site.

A subsequent detailed analysis has been carried out of road traffic noise intrusion through the external building fabric. Sound insulation performance specifications have been proposed for glazing systems and trickle ventilators where any changes are proposed.

The assessment has demonstrated that appropriate internal noise levels should be achievable with the existing glazed units, or the installation of nominal glazing systems and typical trickle ventilators where changes are proposed.

It is essential that certificated performances should be sought from the manufacturer(s) of the proposed glazing/cladding systems and trickle ventilators.

This report is designed to be suitable to discharge typical noise planning conditions, as per our original scope of work. The report should not be relied upon for further reasons, such as the detailed design of mitigation measures.

Clement Acoustics has used all reasonable skill and professional judgement when preparing this report. The report relies on the information as provided to us at the time of writing and the assumptions as made in our assessment. This report contains confidential information and should not be disclosed to third parties.

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LIST OF ATTACHMENTS

20432-SP1 & SP2	Indicative Site Plan
20432-TH1 & TH2	Environmental Noise Time History
Appendix A	Glossary of Acoustic Terminology
Appendix B	ProPG Initial Site Risk Assessment Guidance

REVISION HISTORY

Issue	Date of Issue	Author	Reviewed	Authorised
R0	10/09/2025	[redacted]	[redacted]	[redacted]
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Issue	Comment
R0	First Issue

1.0 INTRODUCTION

Clement Acoustics has been commissioned by Joe Lederberger to assess the suitability of the site at 169 Brighton Road, Worthing for residential development.

Proposals are to change the layout of a three-storey residential building currently providing 3 No. flats to comprise 5 No. flats for residential purposes.

This report presents the results of environmental and internal noise surveys undertaken in order to measure prevailing background levels and details the proposed internal noise level criteria.

Full details of necessary mitigation measures in order to meet the proposed criteria are also provided.

2.0 SITE DESCRIPTION

The proposed development site is currently a three-storey building with 3 No. flats, with plans to make changes to the layout such that 5 No. flats will be provided.

The site is in a residential area facing on to Brighton Road, a street largely populated by residential dwellings. The site is bound by Brighton Road to the south, Windsor Road to the east and adjacent residential dwellings to the north and west.

At the time of the survey, the background noise climate was dominated by road noise from Brighton Road and Windsor Road.

3.0 ARCHITECTURAL ASSUMPTIONS

3.1 Drawings

The drawings summarised in Table 3.1 have been used in our assessment:

No.	Drawing Title	Drawing No.	Date
1.	Existing Plans	2029.EX.01	February 2025
2.	Existing Elevation	2029.EX.02	February 2025
3.	Proposed Elevation	2029.PR.02	February 2025

Table 3.1 List of drawings used in assessment

3.2 Room Volume and Window Dimensions

Based on the above drawings we have based our calculations on the following worst case living room and bedroom and window dimensions:

- Flat 2 Lounge
  - Room Volume: 40 m^3
  - Window Area: 6 m^2
- Loft Bedroom
  - Room Volume: 38 m^3
  - Window Area: 5.2 m^2

3.3 Room Finishes

Our assessment assumes that bedrooms and living rooms will contain typical amounts of soft furnishings, including sofas, chairs, beds and curtains.

4.0 CRITERIA

4.1 Local Authority Requirements

It is understood that the following planning condition has been imposed by Worthing Borough Council:

> *"The development site is along a busy road that has been identified by DEFRA as an important area for noise. Therefore they will need an acoustic scheme to protect the new flats from traffic noise. I would recommend a Pro PG noise assessment to ensure the final acoustic scheme for the flat meets the Good internal noise levels for residential property set out in BS8233 2014 Guidance on Sound Insulation and Noise Reduction for Buildings. The final acoustic scheme shall also consider ventilation and overheating, should windows have to be closed to meet the internal noise standards."*

4.2 National Planning Policy Framework: 2024 (NPPF)

The NPPF, which was first published in 2012 with the latest revision in December 2024, outlines the Government's environmental, economic and social policies for England. The NPPF aims to enable local authorities to produce their own distinctive local and neighbourhood plans, which should be applied in order to meet the needs and priorities of their communities.

Paragraph 187 of The *Conserving and enhancing the natural environment* section of the NPPF includes references to noise stating that:

> *'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, taking into account relevant information such as river basin management plans;…'

Paragraph 198 of The *Ground Conditions and Pollution* section of the NPPF includes references to noise stating that:

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

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

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…'

4.3 BS 8233: 2014 Internal Noise Criteria

BS 8233: 2014: '*Guidance on sound insulation and noise reduction for buildings*' describes recommended acceptable internal noise levels for residential spaces during daytime and night-time hours. These levels are shown in Table 4.1.

Activity	Location	Design Range $L_{eq,T}$	
		Daytime (07:00 - 23:00)	Night-time (23:00 – 07:00)
Resting	Living Room	35 dB(A)	-
Dining	Dining Room/Area	40 dB(A)	-
Sleeping	Bedroom	35 dB(A)	30 dB(A)

Table 4.1 BS 8233: 2014 recommended internal background noise levels

4.4 World Health Organisation Guidelines

The World Health Organisation (WHO) document on *'Guidelines for Community Noise'* 1999 states the internal noise level guidelines as summarised in Table 4.2.

Specific Environment	Critical Health Effects	$L_{eq,T}$	$L_{max,\ F}$
Dwelling, Indoors	Speech Intelligibility and moderate annoyance, daytime and evening	35 dB(A)	-
Inside Bedrooms	Sleep disturbance, night-time	30 dB(A)	45 dB(A)

Table 4.2 WHO Internal noise level guidelines

The document also states:

> *"For a good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45dBA LAmax more than 10-15 times per night, (Vallet & Varnet 1991)."*

4.5 External Noise Criteria

The guidance of BS 8233: 2014, with regards to external amenity spaces, is as follows:

> *"For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited."*

The site is in an area that would be considered suburban, close to main roads and bus stops. We would therefore recommend the guidance upper guideline value of $L_{Aeq,T}$ 55 dB(A) would be an appropriate target although exceedance of this may also be acceptable where unavoidable.

4.6 Proposed Noise Level Criteria

On the basis of Sections 4.1 to 4.5 above, Table 4.3 presents our proposed minimum design targets to be achieved in the worst affected dwellings.

Location	Period	Design Target	
		$L_{eq, T}$	$L_{max, F}$
Living Rooms	Daytime (07:00-23:00 hours)	35 dB(A)	-
Bedrooms	Night-time (23:00-07:00 hours)	30 dB(A)	45 dB(A)*
External Amenity	24 Hours	55 dB(A)	-

Table 4.3 Proposed noise level criteria

***Please note that this is not an absolute limit, however, $L_{max, F}$ 45 dB(A) should not be regularly exceeded.**

The external building fabric would need to be carefully designed to achieve these recommended internal levels.

4.7 Professional Guidance on Planning & Noise (ProPG)

The Institute of Acoustics' *Planning & Noise: Professional Practice Guidance on Planning and Noise: New Residential Development*: 2017 (the ProPG) provides a recommended approach for dealing with noise within the planning process, specifically in relation to new residential developments.

The ProPG follows 2-stage risk assessment approach. The two stages are as follows:

- Stage 1 - an initial assessment where external noise is rated against the risk of adverse effect; and
- Stage 2 – consideration of key elements to determine the suitability of the site for a residential dwelling.

The results of the initial Site noise risk assessment will determine the appropriate risk of developing the site and therefore how appropriate it is from a noise perspective.

Appendix B presents the Initial Site Risk assessment as presented in ProPG.

Stage 2 attempts to determine that good acoustic design principals have been incorporated into the design so that suitable internal noise levels can be achieved in habitable rooms and that suitable external noise levels can be achieved in outdoor amenity space.

4.8 Guidance on Ventilation

Guidance on ventilation and associated acoustic considerations is given in Acoustic Ventilation and Overheating – Residential Design Guide [AVO] issued jointly by the Association of Noise Consultants and the Institute of Acoustics.

In this guide, the need for ventilation (which falls under the requirements of Approved Document F [ADF]) are covered in three main requirements as follows:

- Whole Dwelling Ventilation
    - General ventilation – continuous ventilation of rooms or spaces at a relatively low rate
- Extract Ventilation
    - Removal of air from a space or spaces (typically stale air from bathrooms or kitchens) to outside
- Purge Ventilation
    - Manually controlled removal of air at a high rate to eliminate fumes and odours, e.g. during painting and decorating or from burnt food. May be provided by natural or mechanical means.

Four main template systems for providing each of the above ADF ventilation requirements are summarised in the AVO guide as shown in Table 4.4.

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

Table 4.4 Summary of template systems for ADF ventilation requirements

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

Ventilation requirements will be assessed with consideration to the above systems.

5.0 ENVIRONMENTAL NOISE SURVEY

5.1 Unattended Noise Survey Procedure

Measurements were undertaken at two positions as shown on indicative site drawing 20432-SP1 and 20432-SP2. The choice of these positions was based both on accessibility and on collecting representative noise data in relation to the proposed development.

The surroundings and position used for each monitoring location are described in Table 5.1.

Position No.	Description
UN1	The microphone was mounted on a pole out of the Flat 1 bathroom window. The microphone was positioned 1 m away from the wall. [1]
UN2	The microphone was mounted on a tripod inside the Flat 1 bedrooom at a height of 1.5 m. The microphone was positioned 1 m away from the wall. [1]

Table 5.1 Description of unattended monitoring locations

Note [1]: The position was not considered to be free-field according to guidance found in BS 8233: 2014, and a correction for reflections has therefore been applied. Based on the presence of the reflective surface and the nature of surrounding noise sources, a correction for reflections of 3 dB has been applied, in line with the recommendations of the standard.

Continuous automated monitoring was undertaken for the duration of the survey between 15:00 on 02 September 2025 and 13:30 on 03 September 2025.

The measurement procedure generally complied with ISO 1996-2: 2017: '*Description, measurement and assessment of environmental noise'*.

5.2 Weather Conditions

At the time of set-up and collection of the monitoring equipment and during the attended measurements, the weather conditions were cloudy with low winds and light precipitation. It is understood that the weather conditions during the unattended survey were similar with light winds and occasional precipitation.

It is considered that the weather conditions did not significantly adversely affect the measurements and are therefore considered suitable for the measurement of environmental noise.

5.3 Equipment

The equipment calibration was verified, by means of a field verification check, before and after use and no abnormalities were observed.

The equipment used was as summarised in Table 5.2.

Position	Instrument	Manufacturer	Type
UN1	Class 1 sound level meter[1]	01dB	Solo
UN2	Class 1 sound level meter[1]	Svantek	971
All	Class 1 sound level meter calibrator[1]	RION	NC-74

Table 5.2 Instrumentation used during the survey

Note [1]: Calibration certificates available upon request

6.0 RESULTS

6.1 Unattended Noise Survey Results

The $L_{Aeq:\ 5min}$, $L_{Amax:\ 5min}$, $L_{A10:\ 5min}$ and $L_{A90:\ 5min}$ acoustic parameters were measured at the locations shown in site drawings 20432-SP1 and 20432-SP2.

Measured noise levels are shown as time histories in Attachments 20432-TH1 and 20432-TH2. A summary of the measured noise levels is presented in Table 6.1. Internal noise levels at Position UN2 have been corrected to account for the room currently being unfurnished.

Position	Time Period	Average ambient noise level $L_{Aeq:\ T}$, dB	Maximum noise level $L_{AFmax:\ 5min}$, dB
UN1 [*Environmental*]	Daytime (07:00 - 23:00)	55	-
	Night-time (23:00 - 07:00)	54	70
UN2 [*Internal*]	Daytime (07:00 - 23:00)	30	-
	Night-time (23:00 - 07:00)	28	42

Table 6.1 Average ambient and maximum noise levels

The levels presented in Table 6.1 are as expected considering the site location being adjacent to Brighton Road. Outline mitigation measures are described in Section 8.0 of this report.

Maximum noise levels shown in Table 6.1 are deemed to be 'not regularly exceeded' as required for maximum internal noise level specification purposes.

For the rooms facing Brighton Road, the measurement results at Position UN1 have been distance corrected to predict the average ambient and typical maximum noise level as shown in Table 6.2.

Position	Time Period	Average ambient noise level $L_{Aeq:\,T}$, dB	Maximum noise level $L_{AFmax:\,5min}$, dB
Front Façade [*Environmental*]	Daytime (07:00 - 23:00)	58	-
	Night-time (23:00 - 07:00)	57	73
Front Façade [*Internal*]	Daytime (07:00 - 23:00)	33	-
	Night-time (23:00 - 07:00)	31	45

Table 6.2 Noise levels* for rooms on the front façade

Obtained via distance correction of noise levels measured at the side façade.

6.2 Discussion of Internal Noise Survey Results

The measurement Position UN2 in Table 6.1 represents internal noise levels in the bedroom. The daytime average ambient noise level and night-time maximum noise level are within the limits specified in Table 4.1. Therefore, the existing external building fabric elements would be considered sufficient to achieve noise criteria in the rooms with windows on the east façade.

Predicted noise levels for rooms on the front façade are similarly within the established limits in terms of daytime ambient and night-time typical maximum noise levels. The night-time ambient noise level marginally exceeds the design target by 0.5 dB (when rounded to one decimal place). This would not be considered a significant exceedance and would not be expected to affect residential amenity, particularly given that rooms on the front façade are already in use as residential habitable rooms.

7.0 PROPG INITIAL SITE RISK ASSESSMENT

The environmental noise survey has determined the onsite noise levels. Table 6.1 shows the calculated day and night-time noise levels to be used in the noise assessment.

With reference to the ProPG risk assessment guidance presented in Appendix B, Table 7.1 shows the identified risk level of this site.

Position	Period	Measured Noise Level	ProPG Noise Risk	ProPG Action Guideline
UN1 [*Measured*]	**Daytime** [07:00 - 23:00]	55 dB(A)	Low	See Note [1]
	Night-time [23:00 - 07:00]	54 dB(A)	Low to Medium	See Note [1] and [2]
Front Façade [*Predicted*]	**Daytime** [07:00 - 23:00]	58 dB(A)	Low	See Note [1]
	Night-time [23:00 - 07:00]	57 dB(A)	Medium	See Note [2]

Table 7.1 ProPG initial site risk assessment

Note [1]: Low – '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 Acoustic Design Statement (ADS) which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.'

Note [2]: Medium – '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 demonstrates that a significant adverse noise impact will be avoided in the finished development.'

In consideration of the above, we would therefore recommend that assessing the site according to the guidance of British Standard 8233: 2014 will demonstrate that the impacts of noise can be suitably mitigated to avoid an adverse impact.

Provided adequate mitigation measures are put in place during the design and construction phase of the development, recommended internal noise levels can be achieved. Outline mitigation measures are described in Section 8.0 of this report.

8.0 EXTERNAL BUILDING FABRIC ASSESSMENT

As summarised in Section 6.2, existing internal noise levels are considered to be suitable to protect the amenity of future residents.

The below guidance with regards to non-glazed elements (Section 8.1) and glazed elements (Section 8.2) is therefore only applicable if changes to the external building fabric are required for other reasons (e.g. aesthetics, thermal etc).

The guidance with regards to trickle ventilation (Section 8.3) is applicable if additional passive ventilation is required for ventilation rates, and the guidance with regards to overheating (Section 8.4) is applicable if open windows are being considered to support the overheating strategy.

8.1 External Building Fabric - Non Glazed Elements

It is currently assumed that the non-glazed external building fabric elements of the proposed development would be comprised of existing masonry. This would contribute towards a significant reduction of ambient noise levels in combination with a good quality window configuration, as shown in Section 8.2.

All non-glazed elements of the building facades should be designed to provide a sound reduction performance of at least the figures shown in Table 8.1 when tested in accordance with BS EN 10140-2: 2021.

Element	Octave band centre frequency SRI, dB					
	125	250	500	1k	2k	4k
Non glazed element SRI	41	43	48	50	55	55

Table 8.1 Minimum required sound reduction performance from non-glazed elements

8.2 External Building Fabric - Specification of Glazed Units

Sound reduction performance calculations have been undertaken in order to specify the minimum performance required from new glazed elements in order to achieve recommended internal noise levels shown in Table 4.3. This specification therefore presents the most robust assessment, for BS 8233: 2014 criteria for internal noise levels in a bedroom at all affected facades.

The minimum sound reduction index (SRI) value required for all glazed elements to be installed is shown in Table 8.2. **The performance is specified for the whole window unit, including the frame and other design features.**

Type	Façade	Minimum Sound Reduction Index (dB) at Octave Band Centre Frequency (Hz)						$R_w + C_{tr}$
		125	250	500	1k	2k	4k	
A	Front Façade	21	17	25	35	37	31	25

Table 8.2 Required glazing performance

Note 1 The $R_w + C_{tr}$ should be considered an indication of the overall performance of the glazing. The minimum performance values per octave bands must be achieved.

Where non-vision spandrel panels and external doors are proposed within habitable spaces, they should provide sound reduction performance at least equal to that required of the glazing in order to maintain the acoustic integrity of the external building fabric.

It is essential that prospective glazing system suppliers can demonstrate compliance with the acoustic performance detailed in our specification rather than simply offering a generic glazing configuration. The complete glazing system should achieve the performance requirements stated in Table 8.2 when tested in accordance with BS EN 10140-2: 2021.

It is essential that the performance presented in Table 8.2 is met. However, the following typical configurations would be expected to meet the required levels of sound insulation.

- Type A: 4 mm Glass / 16 mm Air / 4 mm Glass

N.B. Type A is a nominal glazing system.

Please note that the above guidance only considers acoustic performance. Other disciplines, which consider thermal, safety, durability etc. should be consulted to ensure suitability.

8.3 External Building Fabric - Specification of Trickle Ventilators

It is understood the proposal on this site is to use System 1 ventilation as summarised in Table 4.4.

In order to comply with Building Regulations (Part F), fresh air ventilation to habitable rooms is required via trickle ventilators.

The trickle ventilators should comply with the minimum octave band normalised weighted level differences stated in Table 8.3.

Type	Façade	Minimum $D_{n,e}$ Values(dB) at Octave Band Centre Frequency (Hz)						$D_{n,eW}$[1]
		125	250	500	1k	2k	4k	
A	Front Façade	37	25	25	26	27	30	27

Table 8.3 Required ventilator performance

Note 1 The $D_{n,eW}$ should be considered an indication of the overall performance of the ventilator. The minimum performance values per octave bands must be achieved.

It should be ensured that all mechanical extract and supply ventilation is designed to not exceed the internal noise criteria stated in Table 4.3.

N.B. Type A should be achievable with ventilation standard units.

8.4 Overheating Considerations

Through the proposed external façade and glazing configurations detailed in Sections 0 and 8.2, in combination with the trickle ventilation summarised in Section 8.3, it can be demonstrated that acceptable internal noise levels will be achieved with windows closed and background ventilation provided in accordance with System 1 ventilation as summarised in Table 4.4.

Purge ventilation can typically be provided through openable windows, as during periods when purge ventilation is required, internal noise levels are less critical.

Further consideration has also been given to possible overheating requirements. It is understood that the overheating strategy specifies that overheating will be controlled through mechanical means / openable windows. As the overheating strategy is not currently known, consideration has been given to the worst case scenario of openable windows being used.

Overheating noise criteria are presented in Approved Document O [ADO] which states the following:

Noise

3.2 In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to 7am).

3.3 Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

a. 40dB LAeq,T, averaged over 8 hours (between 11pm and 7am).

b. 55dB LAFmax, more than 10 times a night (between 11pm and 7am).

3.4 Where in-situ noise measurements are used as evidence that these limits are not exceeded, measurements should be taken in accordance with the Association of Noise Consultants' Measurement of Sound Levels in Buildings with the overheating mitigation strategy in use.

NOTE: Guidance on reducing the passage of external noise into buildings can be found in the National Model Design Code: Part 2 – Guidance Notes (MHCLG, 2021) and the Association of Noise Consultants' Acoustics, Ventilation and Overheating: Residential Design Guide (2020).

According to BS 8233, a typical building facade with a partially open window offers 15 dB attenuation.

Based on the measured ambient and maximum noise levels shown in Table 5.1, the predicted internal ambient noise levels within habitable rooms with partially open windows used to prevent overheating would be as stated in Table 8.4.

Façade	Night time internal noise level		Exceedance of ADO threshold
	Ambient noise level: $L_{Aeq,8hr}$, dB (ADO Max. Threshold: 40 dB)	Typical maximum noise level: L_{AFmax}, dB (ADO Max. Threshold: 55 dB)	
Side Façade	39	55	Compliant
Front Façade	43	59	Non-Compliant

Table 8.4 Predicted Night Time Internal Noise Levels - Overheating

Note: The above levels assume windows would be partially opened to prevent overheating for an entire night-time period.

The calculated internal levels do not reach the ADO threshold for significance on the side façade, indicating use of openable windows could be an acceptable solution for rooms with windows opening on the side façade.

As the calculated internal levels on the front façade exceed the threshold, this would indicate that openable windows would not be an acceptable solution to overheating for bedrooms with windows opening on the front façade and an alternative solution should be investigated. This could include using openable windows on more sheltered facades, or using a mechanical means of cooling.

Please note that the above ADO requirements only apply to New Build dwellings. Therefore, the guidance of this section is not mandatory for this refurbishment project and is included as good practice only, and due to the Local Authority requirements referencing overheating.

9.0 ASSESSMENT OF EXTERNAL AMENITY SPACE

As shown in Section 4.5, the proposed design target for external amenity space is to ensure noise levels do not exceed L_{Aeq} 55 dB.

The existing garden wraps around the Brighton Road and Windsor Road facades, with some areas close to monitoring position UN1. The gardens are also at ground floor level, with surrounding screening providing a more effective reduction to road traffic noise levels.

Comparing the measured daytime ambient noise levels with this upper design range indicates that gardens close to Position UN2 will benefit from ambient noise levels that comply with the design range.

It is therefore predicted that residents will have access to an area of outdoor amenity space that complies with the design range, particularly when additional screening provided by the existing boundary treatments is taken into account.

10.0 CONCLUSION

An environmental noise survey has been undertaken at 169 Brighton Road, Worthing in order to measure ambient noise levels in the area.

Measured noise levels have allowed an assessment of the level of exposure to noise of the proposed development site to be made.

Outline mitigation measures, including a glazing specification and the use of appropriate ventilation have been recommended and should be sufficient to achieve recommended internal noise levels for the

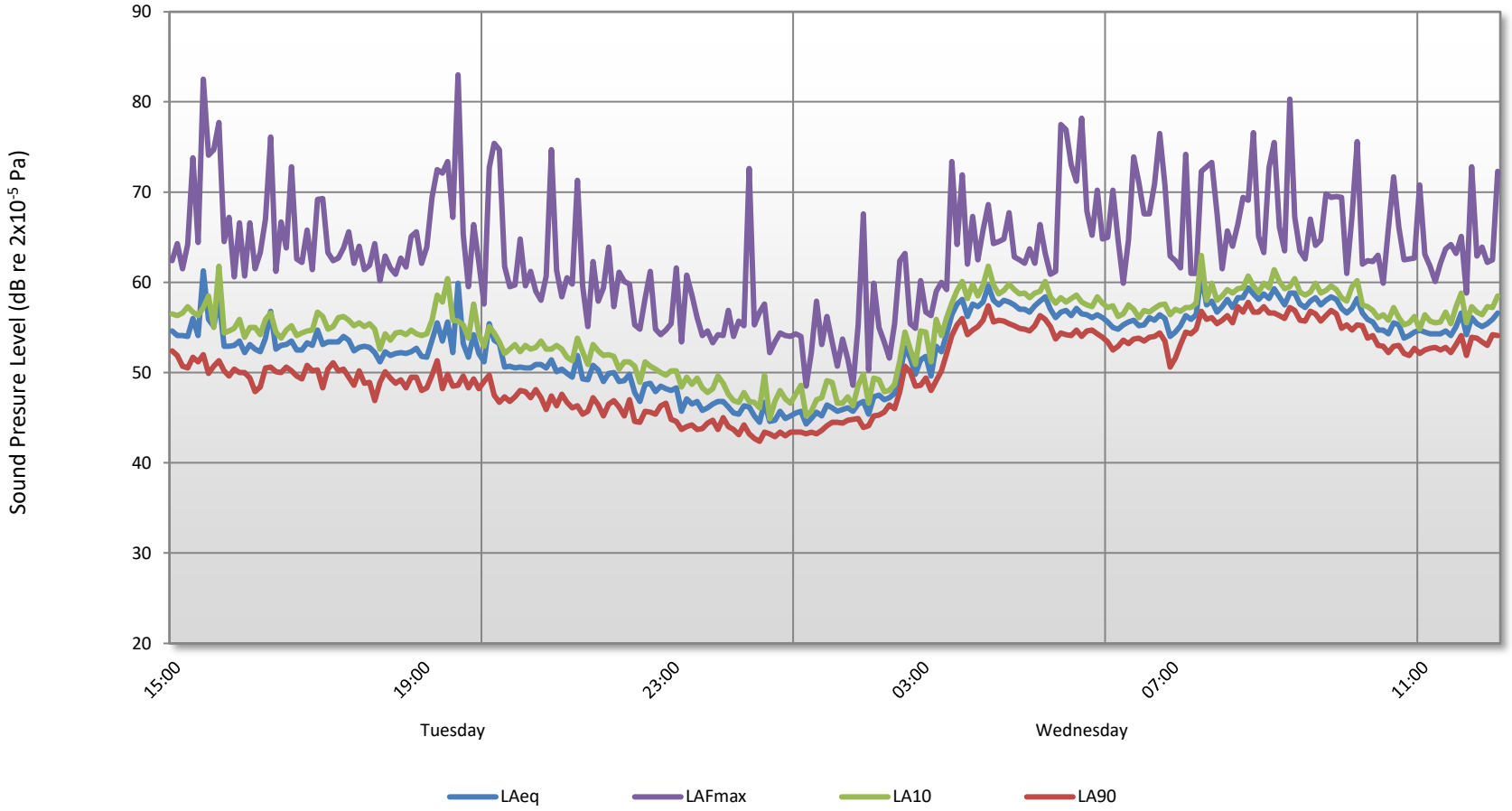
proposed development according to BS 8233: 2014, WHO and the requirements of Worthing Borough Council.

169 Brighton Road, Worthing, West Sussex

Position UN1

Environmental Noise Time History

02 September 2025 to 03 September 2025



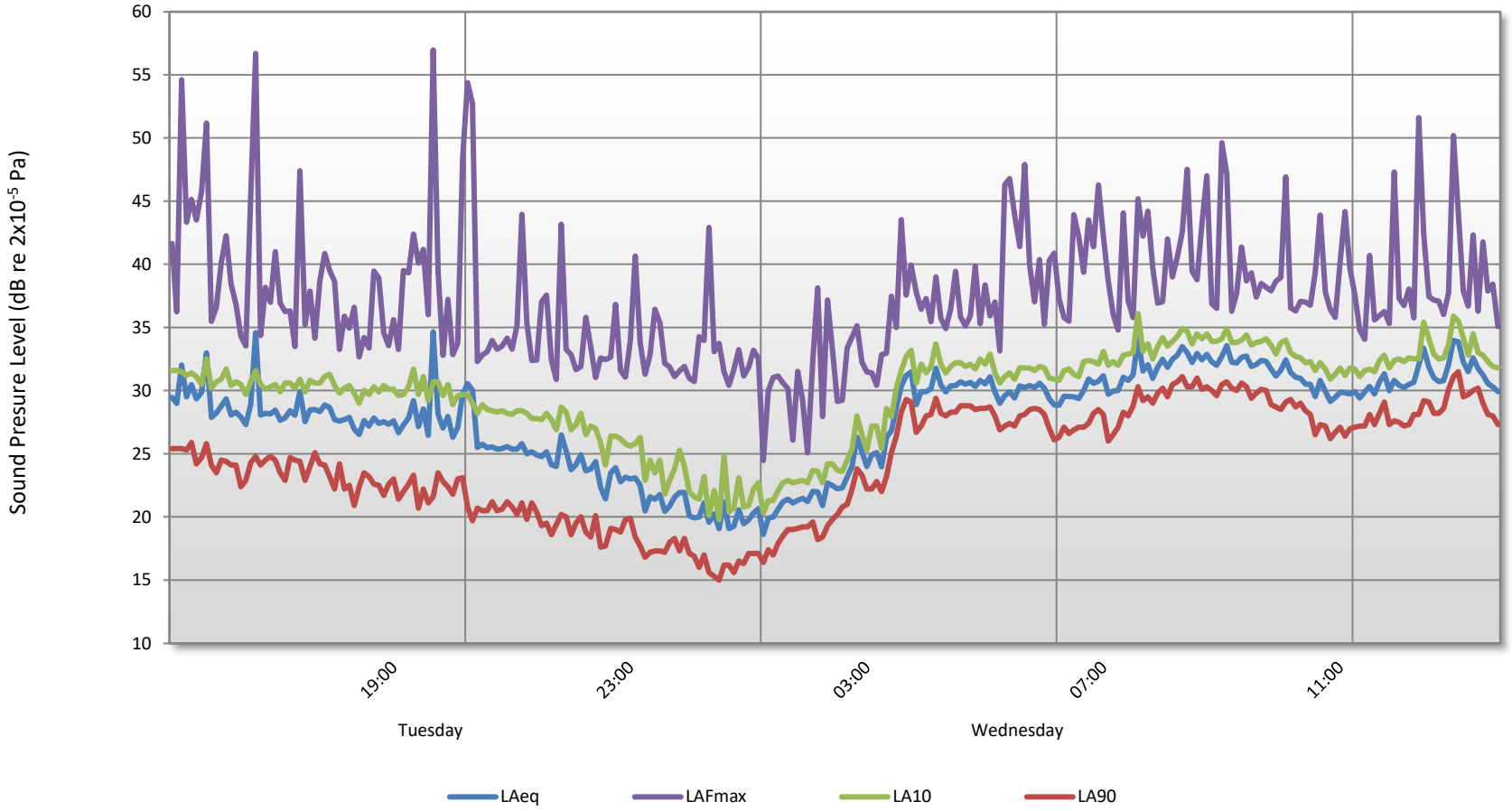
20432-TH1

169 Brighton Road, Worthing, West Sussex

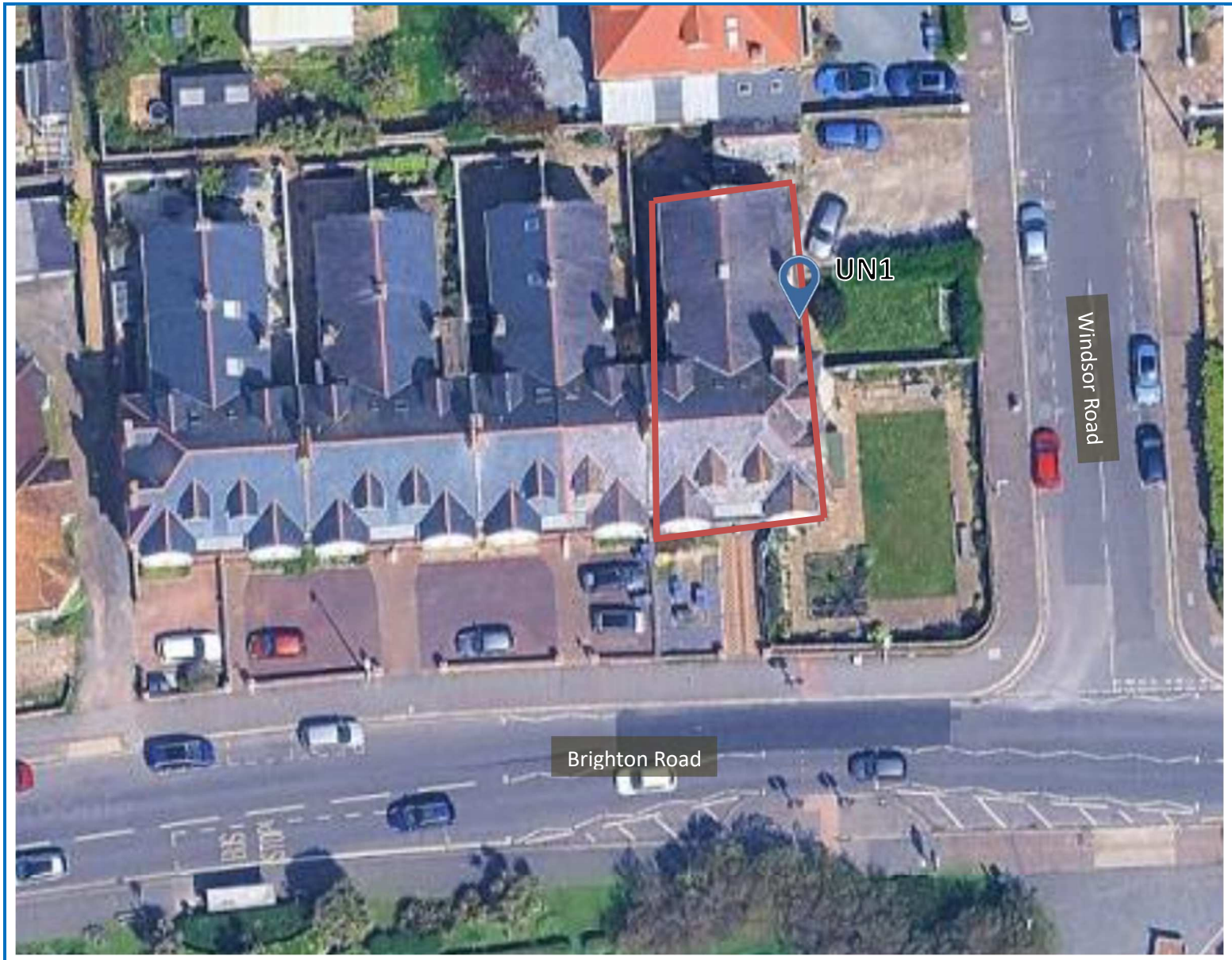
Position UN2

Environmental Noise Time History

02 September 2025 to 03 September 2025



20432-TH2



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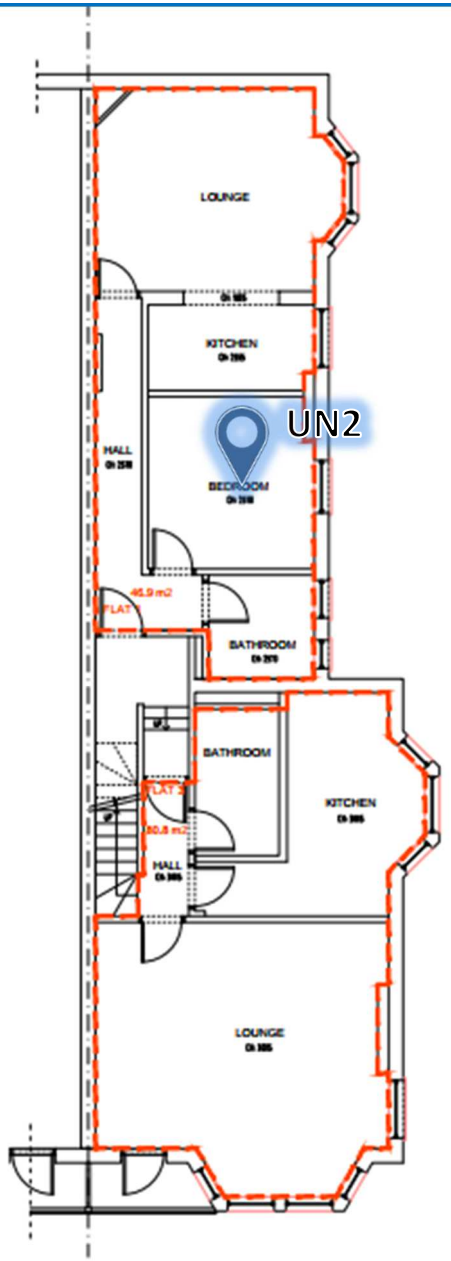
N

Description:
Indicative site plan showing noise monitoring position

Not to scale

Date	15 September 2025
Reference	20432-SP1
Project Name	169 Brighton Road, Worthing, West Sussex
Image ©	Google Maps

Key:	
	Unattended Noise Survey Position



First Floor

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N

Description:
Indicative site plan showing internal noise monitoring position

Not to scale

Date	15 September 2025
Reference	20432-SP1
Project Name	169 Brighton Road, Worthing, West Sussex
Image ©	2029.EX.01

Key:	
	Unattended Noise Survey Position

APPENDIX A

GLOSSARY OF ACOUSTIC TERMINOLOGY

dB(A)

The human ear is less sensitive to low (below 125Hz) and high (above 16kHz) frequency sounds. A sound level meter duplicates the ear's variable sensitivity to sound of different frequencies. This is achieved by building a filter into the instrument with a similar frequency response to that of the ear. This is called an A-weighting filter. Measurements of sound made with this filter are called A-weighted sound level measurements and the unit is dB(A).

L_{eq}

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level L_{eq}. The L_{eq} is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

L_{10}

This is the level exceeded for not more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise

L_{90}

This is the level exceeded for not more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

L_{max}

This is the maximum sound pressure level that has been measured over a period.

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 10 such octave bands whose centre frequencies are defined in accordance with international standards.

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than one alone and 10 sources produce a 10 dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3 dB for each doubling of distance.

APPENDIX A

Subjective impression of noise

Sound intensity is not perceived directly at the ear; rather it is transferred by the complex hearing mechanism to the brain where acoustic sensations can be interpreted as loudness. This makes hearing perception highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a reasonable guide to help explain increases or decreases in sound levels for many acoustic scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud
20	About 4 times as loud

Barriers

Outdoor barriers can be used to reduce environmental noises, such as traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and its construction.

Reverberation control

When sound falls on the surfaces of a room, part of its energy is absorbed and part is reflected back into the room. The amount of reflected sound defines the reverberation of a room, a characteristic that is critical for spaces of different uses as it can affect the quality of audio signals such as speech or music. Excess reverberation in a room can be controlled by the effective use of sound-absorbing treatment on the surfaces, such as fibrous ceiling boards, curtains and carpets.

APPENDIX B

ProPG Initial Site Risk Assessment Guidance

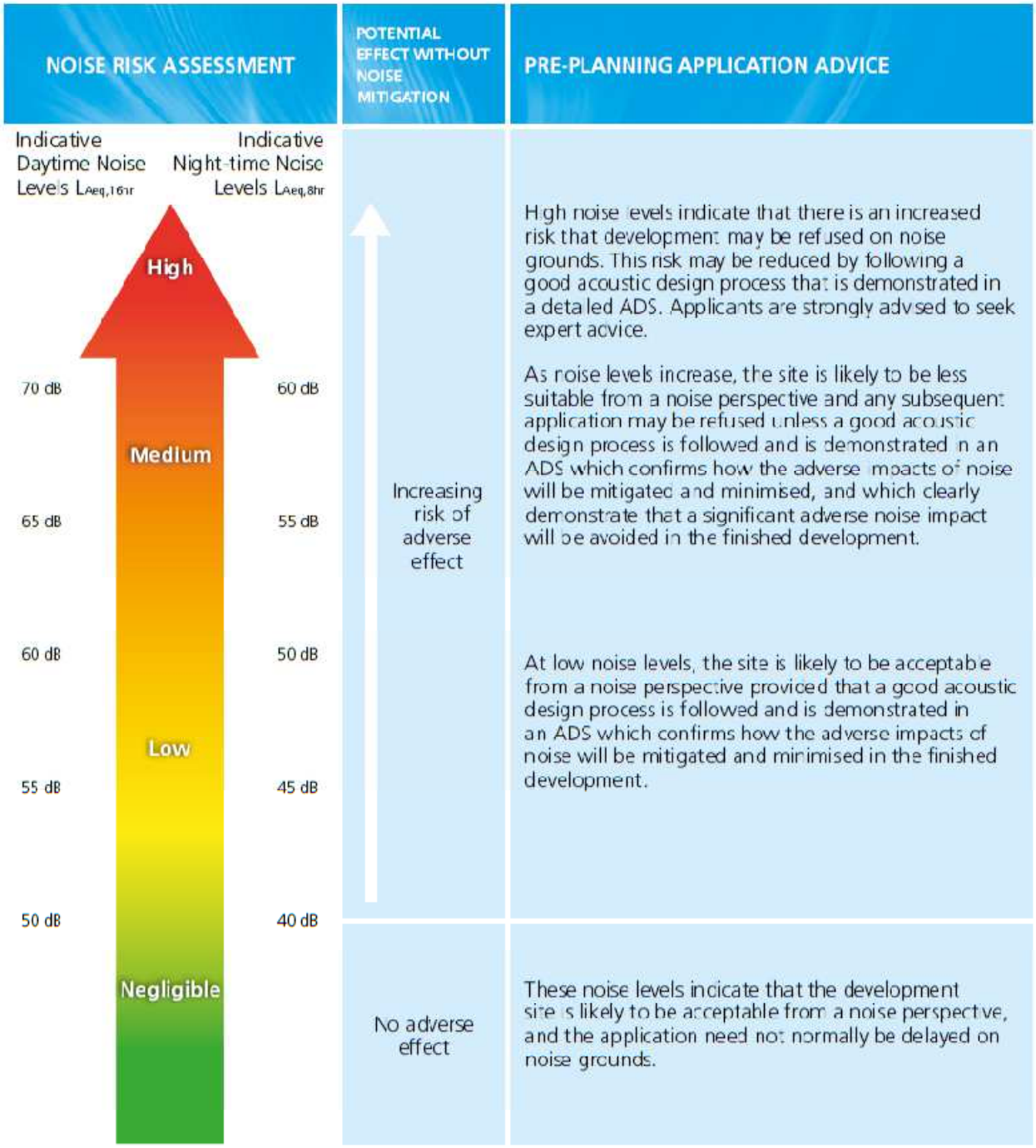


Figure 1. Stage 1– Initial Site Noise Risk Assessment

ProPG – Figure 1 – Initial Site Risk Assessment