



43 London
Street,
Reading,
RG1 4PS

Noise Impact Assessment

July 2025



Ref: 25-15593
NIA

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY	5
2. INTRODUCTION	7
3. JUNE 2020 PLANNING CONDITIONS.....	8
4. GUIDANCE DOCUMENTS.....	10
5. BASELINE NOISE LEVELS	17
6. INITIAL SITE RISK ASSESSMENT	20
7. FULL PROPG RESIDENTIAL ASSESSMENT	21
8. PLANT NOISE LEVELS.....	24
9. PLANT NOISE ASSESSMENT (PLANNING CONDITION 19)	25
10. INTERNAL SOUND LEVEL (PLANNING CONDITION 20)	28
11. CONCLUSION.....	30
12. APPENDIX 1: GLOSSARY OF ACOUSTIC TERMINOLOGY.....	31
13. APPENDIX 2: PROFESSIONAL STATEMENT	32
14. APPENDIX 3: LIST OF EQUIPMENT	32
15. APPENDIX 4: DETAILED NOISE MEASUREMENT RESULTS.....	33
16. APPENDIX 5: DETAILED PLANT NOISE LEVELS AND TONALITY ASSESSMENT OF MRXBOX (AB) - ECO2 (OCTAVE BANDS)	48

Quality Standards Control

mail@syntegrargroup.com
Tel: 0330 053 6774

LONDON | READING | TONBRIDGE | BRISTOL

Registered Company No. 06408056
VAT Registration No. 980016044
BSI Certificate Number FS 710041



The signatories below verify that this document has been prepared in accordance with our quality control requirements. These procedures do not affect the content and views expressed by the originator.

This document must only be treated as a draft unless it has been signed by the originators and approved by a director.

Revision	NIA
Date	15/07/2025
Prepared by	S. Hale BSc(Hons) MIOA
Checked by	C. Mayo
Authorised by	S. Hale BSc(Hons) MIOA

Limitations

Syntegra Consulting Ltd ("SC") has prepared this report for the sole use of the client in accordance with the agreement under which our services were performed. No other warranty, expressed or implied, is made as to the professional advice included in this report or any other services provided by SC.

The conclusions and recommendations contained in this report are based upon information provided by others and upon the assumption that all relevant information has been provided by those parties from whom it has been requested and that such information is accurate. Information obtained by SC has not been independently verified by SC, unless otherwise stated in the report.

The methodology adopted and the sources of information used by SC in providing its services are outlined in this report. The work described in this report was undertaken in **June/July 2025** and is based on the conditions encountered and the information available during the said period of time. The scope of this report and the services are accordingly factually limited by these circumstances.

Where assessments of works or costs identified in this report are made, such assessments are based upon the information available at the time and where appropriate are subject to further investigations or information which may become available.

SC disclaim any undertaking or obligation to advise any person of any change in any matter affecting the report, which may come or be brought to SC's attention after the date of the report.

Certain statements made in the report that are not historical facts may constitute estimates, projections or other forward-looking statements and even though they are based on reasonable assumptions as of the date of the report, such forward-looking statements by their nature involve risks and uncertainties that could cause actual results to differ materially from the results predicted. SC specifically does not guarantee or warrant any estimate or projections contained in this report.

Costs may vary outside the ranges quoted. Whilst cost estimates are provided for individual issues in this report these are based upon information at the time which can be incomplete. Cost estimates for such issues may therefore vary from those provided. Where costs are supplied, these estimates should be considered in aggregate only. No reliance should be made in relation to any division of aggregate costs, including in relation to any issue, site or other subdivision.

No allowance has been made for changes in prices or exchange rates or changes in any other conditions which may result in price fluctuations in the future. Where assessments of works or costs necessary to achieve compliance have been made, these are based upon measures which, in SC's experience, could normally be negotiated with the relevant authorities under present legislation and enforcement practice, assuming a proactive and reasonable approach by site management.

Forecast cost estimates do not include such costs associated with any negotiations, appeals or other non-technical actions associated with the agreement on measures to meet the requirements of the authorities, nor are potential business loss and interruption costs considered that may be incurred as part of any technical measures.

Copyright

© This report is the copyright of SC. Any unauthorised reproduction or usage by any person other than the addressee is strictly prohibited.

1. Executive Summary

An assessment has been carried out of the present noise climate at **43 London Street, Reading, RG1 4PS** and the impact of that noise on the proposed development.

The proposed scheme involves the creation of 48 sqm community use (Class D1) and 21no residential units (2 x studio, 7 x 1 bed, 10 x 2 two bed and 2 x 3 bed units) together with associated services, enclosures, parking and landscaping.

The site is located at 43 London Street (A327), Reading, the area is classed as urban with commercial units at ground floor level and residential dwellings above. Local to the area are bars and restaurants, bus stops on either side of the road and The Oracle shopping centre in close proximity to the site.

The assessment is based on the results of a noise measurement survey that has been carried out over a five-day period at the proposed development site and has considered the advice of local and national planning policy and best practice guidance.

The initial site risk assessment identified that the site has a *high* risk in terms of noise.

Good acoustic design has been shown by careful consideration of the building envelope construction.

It has been identified that the requirements of the Local Authority in respect of internal noise levels can only be achieved through careful consideration of the building envelope. We note that this does not necessitate that the windows be sealed shut but requires that an alternate primary means of ventilating the properties is provided (as defined by the Building Regulations Approved Document F). The construction assumptions that have led to this conclusion are:

- **The façade build-up will be a standard brick and block construction (or equivalent) to achieve an R_w of approximately 55 dB.**
- **For the front façade with a line of sight to London Street:**
 - **A double-glazing system in a 4/180/6 configuration with absorbent reveals, tightly closed (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 38 dB R_w .**
 - **An alternative means of ventilation will be installed to allow adequate background ventilation without the requirement to open windows.**
 - **Purge ventilation (as defined by ADF) through open windows.**
 - **MVHR System to be installed to provide mitigation for overheating.**
- **For the rear façade and side windows with no line of sight to London Road:**
 - **A typical double-glazing system in a 4/16/4 configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 28 dB R_w .**
 - **Appropriately specified acoustic trickle vents, with a $D_{n,e,w}$ of at least 34 dB, will be installed to allow adequate background ventilation without the requirement to open windows.**
 - **Purge ventilation (as defined by ADF) through open windows.**
 - **MVHR System to be installed to provide mitigation for overheating.**

The assessment has also shown that the external noise level criteria would be achieved within most of the proposed amenity areas. Access to nearby public amenity areas can off-set the relatively loud noise environment in those proposed amenity areas.

Additionally, an assessment of plant noise has been carried out and it has been identified that adverse impacts can easily be avoided, assuming the criteria identified within this report are achieved.

Overall, it has been shown that, through careful consideration of the building envelope construction, the proposed development should avoid future residents being exposed to harmful levels of noise.

It can therefore be concluded that significant adverse impacts on the health or quality of life of those future residents would be avoided, in line with the aims of the NPPF, NPSE and PPG-Noise.

2. Introduction

This report has been prepared to support the planning application for the proposed development at **43 London Street, Reading, RG1 4PS.**

The proposed scheme involves the creation of 48 sqm community use (Class D1) and 21no residential units (2 x studio, 7 x 1 bed, 10 x 2 two bed and 2 x 3 bed units) together with associated services, enclosures, parking and landscaping.

The report assesses, through on-site noise measurements, the impact of the existing noise climate on the proposed development.

A glossary of acoustic terminology is provided in **Appendix 1.**

The site is located at 43 London Street (A327), Reading, the area is classed as urban with commercial units at ground floor level and residential dwellings above. Local to the area are bars and restaurants, bus stops on either side of the road and The Oracle shopping centre in close proximity to the site.

The location of the proposed development site is provided in **Figure 2.1.**



Figure 2.1: Site Location

3. June 2020 Planning Conditions

A planning application for the development was submitted, and the following conditions were placed on the development in June 2020.

3.1. Planning Condition 19

“No mechanical plant, (excluding typical low-duty fans serving residential dwellings, i.e, toilet extractor fans) shall be installed until a noise assessment of the proposed mechanical plant has been submitted and approved by the Local Planning Authority.

The assessment shall be carried out in accordance with BS4142:2014 methodology.

The predicted specific sound level ($L_{Aeq,Tr}$) (with reference to BS:4142) as measured at a point 1 metre external to the nearest noise-sensitive façade shall be at least 10 dB below the pre-existing background sound level, $L_{A90,T}$ when all plant/equipment (or any part of it) is in operation.

The predicted rating level, $L_{Ar,Tr}$ (specific sound level plus any adjustment for the characteristic features of the sound) as measured at a point 1 metre external to the nearest noise-sensitive façade (habitable window of a dwelling) shall not exceed the pre-existing background sound level, $L_{A90,T}$ when all plant/equipment (or any part of it) is in operation.

The plant shall thereafter only be installed in accordance with the assessment and shall thereafter be maintained so that it operates to the same standard.

REASON: To safeguard the amenities of the adjoining premises and the area generally, in accordance with Policy CC8 and EN17 of the Reading Borough Local Plan 2019.”

3.2. Planning Condition 20

“No development shall commence beyond foundation level until a detailed scheme, informed by an assessment of the current noise environment including noise generated by nearby venues, for protecting the dwellings from the external noise environment of the area has been submitted to and approved, in writing, by the Local Planning Authority. The scheme itself shall be designed, specified and constructed so that the sound insulation performance of the structure and the layout of the dwellings are such that the indoor ambient noise levels do not exceed the values detailed in Table 4 of BS 8233:2014 and the L_{MAX} value stated in Noise Statement, prepared by Finch Consulting, ref: 1922217, dated June 2019.

If a Risk Overheating assessment recommends opening windows for a significant period for comfort cooling purposes and this will lead to an internal noise level increase of 5 dBA or greater above BS 8233:2014 recommended internal levels, the scheme shall include provision of alternative mechanical ventilation with minimum performance equivalent to a mechanical heat recovery (MVHR) system with cool air bypass as an alternative means of cooling and ventilation.

Noise from the system should not result in BS8233:2014 internal levels being exceeded. Thereafter, the development shall not be carried out other than in accordance with the approved scheme which shall be completed before any part of the accommodation hereby approved is occupied, unless the Local Planning Authority otherwise agrees in writing and shall be retained in accordance with such measures thereafter.

REASON: These details are required due to insufficient information being contained within this submission and in order to safeguard the amenity of occupants in accordance with Policy CC8 of the Reading Borough Local Plan 2019.”

4. Guidance Documents

4.1. Planning Practice Guidance for Noise

The Planning Practice Guidance for Noise (PPG-Noise) was published in March 2014 and last updated in July 2019. The PPG provides advice on how to determine the noise impact on development:

‘Plan-making and decision making need to take account of the acoustic environment and in doing so consider:

- *whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved.*

In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation. As noise is a complex technical issue, it may be appropriate to seek experienced specialist assistance when applying this policy.’

The document goes on to provide a definition for the levels of noise exposure at which an effect may occur:

‘Significant observed adverse effect level: *this is the level of noise exposure above which significant adverse effects on health and quality of life occur.*

Lowest observed adverse effect level: *this is the level of noise exposure above which adverse effects on health and quality of life can be detected.*

No observed effect level: *this is the level of noise exposure below which no effect at all on health and quality of life can be detected.’*

It is important to understand that as the PPG-Noise does not provide any advice with respect to specific noise levels/ limits for different sources of noise, it is appropriate to consider other sources of advice and guidance documents when considering whether new developments would be sensitive to the prevailing acoustic environment.

4.2. Professional Practice Guidance on Planning & Noise.

The Professional Practice Guidance (ProPG) on Planning and Noise for New Residential Development was published in May 2017 by the Association of Noise Consultants (ANC), Institute of Acoustics (IOA) and Chartered Institute of Environmental Health (CIEH). The document has been produced to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England and provides numerical acoustic standards in line with the objectives of the Government’s planning and noise policy. As a collaboration between the ANC, IOA and CIEH the document has been designed to encourage a good acoustic design process and aims to protect people from the harmful effects of noise.

The ProPG notes that it ‘does not constitute an official government code of practice and neither replaces nor provides an authoritative interpretation of the law or government policy on which users should take their own advice as appropriate’.

The ProPG advocates a two-stage approach, first providing an initial noise risk assessment of the proposed development site before undertaking a systematic approach to the noise impact assessment. The results of the initial noise risk assessment are an indication as to how detailed the noise impact assessment will need to be in order to satisfactorily assess all acoustic challenges.

4.2.1. Stage 1: Initial Site Noise Risk Assessment

The initial noise risk assessment compares the site noise levels (which can be obtained by measurement or prediction, or a combination of the two, as appropriate) against a risk scale and determines the risk of adverse effects from noise at the site. The purpose of the initial noise risk assessment is to provide an indication of the level of acoustic challenges at the site. In general, the higher the level of risk identified, the greater the level of detail that will be required within the noise impact assessment in order to satisfactorily demonstrate that adverse impacts will be minimised to an acceptable level.

The initial risk assessment and associated notes are provided in Figure 1 of the ProPG and reproduced in **Table 4.1**.

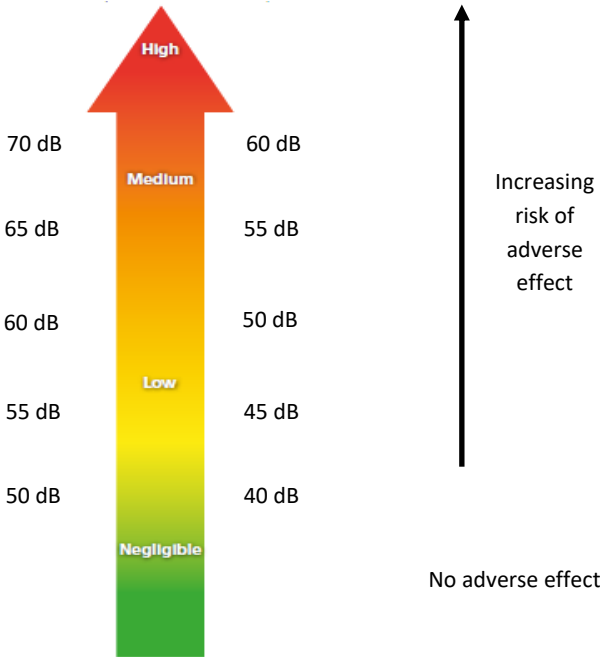
Noise Risk Assessment		Potential Effect Without Noise Mitigation	Pre-Planning Application Advice
Indicative Daytime Noise Levels, $L_{Aeq,16hr}$	Indicative Night-time Noise Levels, $L_{Aeq,8hr}$		
		High noise levels indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed Acoustic Design Statement (ADS). Applicants are strongly advised to seek expert advice. As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development. 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. These noise levels indicate that the development site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds.	
Notes: a. Indicative noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures. b. 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”. c. $L_{Aeq,16hr}$ is for daytime 0700 hrs – 2300 hrs, $L_{Aeq,8hr}$ is for night-time 2300 hrs – 0700 hrs. d. An indication that there may be more than 10 noise events at night (2300 hrs – 0700 hrs) with $L_{Amax,F} > 60$ dB means that the site should not be regarded as negligible risk.			

Table 4.1: Stage 1: Initial Site Risk Assessment

Where sites are exposed to industrial or commercial noise that is considered to be “dominant” then an assessment in line with BS 4142:2014 ‘*Methods for rating and assessing industrial and commercial sound*’ should be carried out.

4.2.2. Stage 2: Full Assessment

4.2.2.1. Stage 2: Element 1 – Good Acoustic Design Process

Following a good acoustic design process is an implicit part of achieving good design as required by Government planning and noise policy. It is imperative that acoustic design is considered at an early stage of the development process and the aim should be to avoid “unreasonable” acoustic conditions and prevent “unacceptable” acoustic conditions.

Good acoustic design does not simply mean compliance with the recommended internal and external noise criteria. Instead, an integrated solution should be provided whereby the optimal acoustic outcome is achieved, without design compromises that will adversely affect living conditions and the quality of life of residents or other sustainable design objectives and requirements.

A good acoustic design should consider (in this order):

- *‘Maximising the spatial separation of noise sources and receptors.*
- *Investigating the necessity and feasibility of reducing existing noise levels and relocating existing noise sources.*
- *Using topography and existing structures (that are likely to last the expected life of the noise-sensitive scheme) to screen the proposed development site from significant sources of noise.*
- *Incorporating noise barriers as part of the scheme to screen the proposed development site from significant sources of noise.*
- *Using the layout of the scheme to reduce noise propagation across the site.*
- *Using the orientation of buildings to reduce the noise exposure of noise-sensitive rooms.*
- *Using the building envelope to mitigate noise to acceptable levels.’*

4.2.2.2. Stage 2: Element 2 – Internal Noise Level Guidelines

The ProPG contains Figure 2, which is a table with associated notes drawing on the advice contained within BS 8233:2014 ‘*Guidance on sound insulation and noise reduction for buildings*’, the World Health Organization’s Guidelines for Community Noise 1999 (WHO guidelines) and current best practice. This table is reproduced in **Table 4.2**.

Activity	Location	07:00 – 23:00	23:00 – 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$ 45 dB $L_{Amax,F}$ (Note 4)

NOTE 1 The Table provides recommended internal L_{Aeq} target levels for overall noise in the design of a building. These are the sum total of structure-borne and airborne noise sources. Ground-borne noise is assessed separately and is not included as part of these targets, as human response to ground-borne noise varies with many factors such as level, character, timing, occupant expectation and sensitivity.

NOTE 2 The internal L_{Aeq} target levels shown in the Table are based on the existing guidelines issued by the WHO and assume normal diurnal fluctuations in external noise. In cases where local conditions do not follow a typical diurnal pattern, for example on a road serving a port with high levels of traffic at certain times of the night, an appropriate alternative period, e.g. 1 hour, may be used, but the level should be selected to ensure consistency with the internal L_{Aeq} target levels recommended in the Table.

NOTE 3 These internal L_{Aeq} target levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year's Eve.

NOTE 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45 dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events.

NOTE 5 Designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic design. Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded, subject to the further advice in Note 7.

NOTE 6 Attention is drawn to the requirements of the Building Regulations.

NOTE 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal L_{Aeq} target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved. The more often internal L_{Aeq} levels start to exceed the internal L_{Aeq} target levels by more than 5 dB, the more that most people are likely to regard them as "unreasonable". Where such exceedances are predicted, applicants should be required to show how the relevant number of rooms affected has been kept to a minimum. Once internal L_{Aeq} levels exceed the target levels by more than 10 dB, they are highly likely to be regarded as "unacceptable" by most people, particularly if such levels occur more than occasionally. Every effort should be made to avoid relevant rooms experiencing "unacceptable" noise levels at all and where such levels are likely to occur frequently, the development should be prevented in its proposed form.

Table 4.2: ProPG Internal Noise Level Guidelines

4.2.2.3. Stage 2: Element 3 – External Amenity Area Noise Assessment

The ProPG considers the advice provided within BS 8233:2014 and the PPG-Noise in respect of external amenity areas, and presents the following advice, which is selected from both documents, in order to carry out a full assessment of noise levels:

- 'If external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended.'*
- 'The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB $L_{Aeq,16hr}$.'*
- 'These guideline values may not be achievable in all circumstances where development might*

be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces.'

- iv. *'Whether or not external amenity spaces are an intrinsic part of the overall design, consideration of the need to provide access to a quiet or relatively quiet external amenity space forms part of a good acoustic design process'*
- v. *'Where, despite following a good acoustic design process, significant adverse noise impacts remain on any private external amenity space (e.g. garden or balcony) then that impact may be partially off-set if the residents are provided, through the design of the development or the planning process, with access to:*
 - *A relatively quiet façade (containing openable windows to habitable rooms) or a relatively quiet externally ventilated space (i.e. an enclosed balcony) as part of their dwelling; and/or*
 - *a relatively quiet alternative or additional external amenity space for sole use by a household, (e.g. a garden, roof garden or large open balcony in a different, protected, location); and/or*
 - *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, publically accessible, external amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minute walking distance). The local planning authority could link such provision to the definition and management of Quiet Areas under the Environmental Noise Regulations.'*

4.2.2.4. Stage 2: Element 4 – Assessment of Other Relevant Issues

The final element of Stage 2 is an assessment of 'other relevant issues' and the ProPG suggests that the following issues are considered before making any final conclusions with respect to noise impacts:

- i. *'compliance with relevant national and local policy'*
- ii. *'magnitude and extent of compliance with ProPG'*
- iii. *'likely occupants of the development'*
- iv. *'acoustic design v. unintended adverse consequences'*
- v. *'acoustic design v. wider planning objectives'*

The ProPG notes that *'not all of the issues listed above will arise in every planning application and some may already have been addressed as an inherent part of good acoustic design. In addition, LPAs [Local Planning Authorities] may wish to add other relevant issues depending on local circumstances and priorities.'*

4.3. Acoustics, Ventilation and Overheating Residential Design Guide

The Acoustics, Ventilation and Overheating Residential Design Guide (AVOG) was published in January 2020 by the Association of Noise Consultants (ANC). The document has been produced to provide practitioners with guidance on how to determine the impact of internal noise levels during both normal (background) ventilation conditions and during overheating conditions. It is recognised that a slightly relaxed set of noise criteria is appropriate during periods of overheating and this is readily accepted by residents of dwellings to counter-balance the discomfort of overheating and exposure to noise through opening windows. The document suggests a balanced approach, protecting against significant impacts of noise exposure whilst allowing for slightly relaxed criteria. This in practice means that windows can be opened on more occasions to mitigate overheating (when compared to normal

background ventilation conditions) without creating an unacceptable significant impact from exposure to noise.

4.4. Approved Document F

The Building Regulations Approved Document F (ADF) is concerned with ventilation in dwellings. Three types of ventilation are covered in the document, which are listed below and their interaction with the internal noise level criteria presented in Tables 3.3, 3.4 and 3.6 are presented:

- Whole dwelling (background) ventilation – the internal noise level criteria should be achieved with the ventilation system in operation (e.g. window or trickle vent open, or mechanical ventilation system operational).
- Extract ventilation to remove water vapour and indoor air pollutants where they are produced in significant quantities (e.g. kitchens, utility rooms and bathrooms) – internal noise level criteria are only appropriate for habitable rooms (e.g. living rooms and bedroom) so are not normally applicable.
- Purge ventilation to rapidly dilute air pollutants and water vapour when necessary, in habitable rooms – this is normally only for a very short period of time as required and internal noise level criteria are therefore not applicable.

4.5. Approved Document O

The Building Regulations Approved Document O (ADO) is an Approved Document concerned with overheating in dwellings.

In terms of noise criteria, the document suggests that when internal noise levels at night would be above a certain level, open windows would not be suitable for mitigating overheating. These levels are:

- 40 dB $L_{Aeq,8hrs}$ (2300 hrs – 0700 hrs)
- 55 dB L_{AFmax} more than 10 times per night (2300 hrs – 0700 hrs).

4.6. British Standard 4142:2014

British Standard 4142:2014 “Methods for rating and assessing industrial and commercial sound” provides a method for the measurement and rating of industrial type noise sources and background noise levels outside dwellings. The rating level (defined in the BS) is used to rate the noise source outside residential dwellings (this is defined as the “specific sound level”).

The rating level is determined by assessing the character of the noise and applying an acoustic feature correction if appropriate. Corrections are applied for the tonality and intermittency of the noise source which can both make noise more noticeable.

The initial assessment described in BS 4142 to determine whether an adverse impact is likely is based on establishing the difference between the rating level and the background noise level outside the residential property of interest. The British Standard states that the following points should be considered:

- *‘Typically, the greater this difference, the greater the magnitude of the impact.’*
- *A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*

- *A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
- *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.'*

5. Baseline Noise Levels

5.1. 2025 Baseline Noise Survey

In order to determine the extent to which the site is currently affected by noise, a detailed measurement study has been carried out at the site. Measurements have been carried out in order to characterise the existing noise climate over a five-day period between 1130 hrs on Thursday 26th June and 1625 hrs on Monday 30th June 2025.

The area is described as rural, with a concentration of restaurants and pubs along London Street (A327). The dominant noise source was Road Traffic Noise (RTN), primarily from constant traffic along the A327 and A329. To the rear of the building, several plant extract units were audible in certain locations; however, they did not appear to exceed the existing background noise levels. This is supported by the time history graphs for MP2, which show typical fluctuations in noise levels.

The noise measurements utilised both a Rion NL52 and a Svantex 307 Type 1 Precision Sound Level Meters (SLMs) with a current certificate of calibration, the full list of equipment is detailed in **Appendix 3**. Before and after the measurement period the equipment was checked for calibration in order to ensure that the equipment had remained within reasonable calibration limits (+/- 0.5 dB). Noise Measurements were carried out in consecutive 5 minutes periods with a 1 second resolution.

During the noise measurement survey, daytime temperatures reached up to 29°C, dropping to -2°C overnight. Wind speeds were predominantly below 5 m/s, with occasional strong gusts reaching approximately 7 m/s from a southern direction. Cloud cover was recorded at 15% during setup and 25% during collection. All data affected by meteorological conditions have been excluded from the dataset to ensure accuracy

Noise measurements were carried out over a five-day period at Measurement Position 1 (MP1) in a freefield measurement location. The SLM was located attached to a lamppost directly outside the front of site at approximately 1st floor height. This location was selected as being representative of the worst-case façade noise levels, with direct line of sight to London Street.

Noise measurements were carried out over a five-day period at Measurement Position 1 (MP2) in a freefield measurement location. The SLM was located attached to a telescopic tripod at the rear of the site at approximately 1st floor height. This location was selected as being representative of the worst-case façade noise levels to the rear of the development.

The noise monitoring positions are shown in **Figure 5.1**.

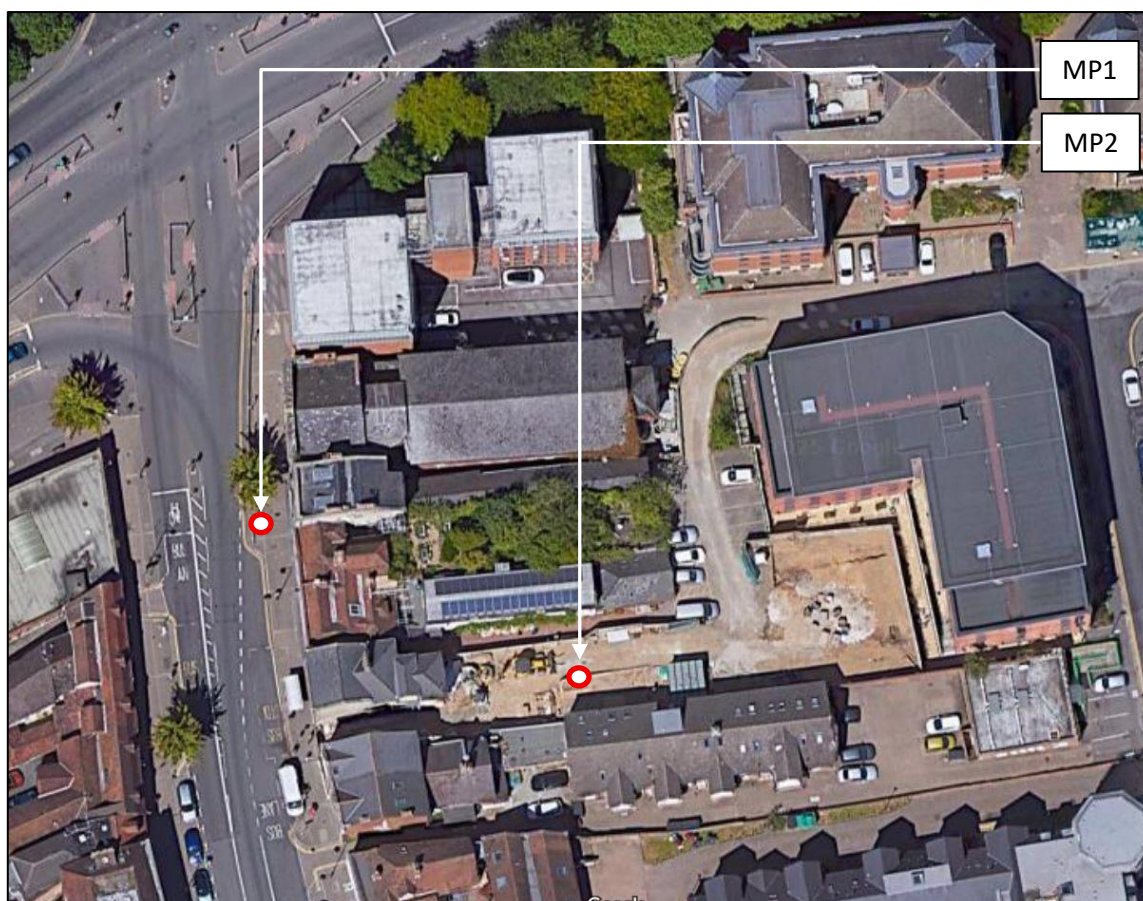


Figure 5.1: Noise Monitoring Location

Table 5.1 below displays a summary of the measured noise levels and detailed measurement results are presented in **Appendix 4**.

Measurement Position	Period (hours)	$L_{Aeq,T}$ (dB)	L_{Amax} (dB)	L_{A90}
MP1	Daytime (0700 – 2300)	70	93	55
	Night-time (2300 – 0700)	64	83	44
MP2	Daytime (0700 – 2300)	57	76	55
	Night-time (2300 – 0700)	50	72	41

Table 5.1: Summary of Free Field Semi-Permanent Noise Levels

Note: The average noise levels stated are logarithmic for L_{Aeq} . The $L_{Amax,F}$ noise levels stated are the arithmetic average of the hourly noise levels during the daytime (0700 hrs – 2300 hrs) and the 10th highest $L_{Amax,F,5min}$ noise level at night (2300 hrs – 0700 hrs), as noted in Table 4.2.

5.2. Original 2019 Noise Assessment

Planning condition 20 requests that “the L_{MAX} value stated in Noise Statement, prepared by Finch Consulting, ref: 1922217, dated June 2019” be used in the assessment. These planning conditions were placed 5 years ago.

A noise survey for the Finch Consulting report was completed in 2019, and consisted of 3 measurement positions.

Table 3 of the Finch Consulting report, copied below in **Table 5.2**,

Position	Measurement period	Range of recorded sound pressure levels (dB)			
		L_{Aeq} (15 min)	L_{Amax} (15 min)	L_{A10} (15 min)	L_{A90} (15 min)
1	Daytime (07.00 – 23.00 hours)	65-74	72-102	69-74	55-64
	Night-time (23.00 – 07.00 hours)	57-67	72-87	59-71	50-56
2	Daytime (07.00 – 23.00 hours)	47-69	56-86	49-73	43-58
	Night-time (23.00 – 07.00 hours)	41-61	50-89	44-52	38-48
3	Daytime (07.00 – 23.00 hours)	51-78	64-102	53-83	45-67
	Night-time (23.00 – 07.00 hours)	44-59	55-78	47-61	39-58

Table 5.2: Summary of Finch Consulting Noise Levels

It should be noted that the Finch Consulting report does not refer to the 10th highest L_{max} noise level, instead stating a range of noise levels for day and night and has been assessed with a 15-minute resolution.

With the data being 5 years old and the inaccuracies in the analysis of the noise data, we have opted to assess the development using the 2025 noise levels presented in **Table 5.1** which has also considered the 10th highest L_{max} noise level as per the standard.

6. Initial Site Risk Assessment

The initial site risk assessment has been carried out by comparing the results of the noise measurement survey against the criteria presented in **Table 4.1**. The outcome of the initial site risk assessment is presented in **Table 6.1**.

Measurement Position	Daytime Ambient Noise Level $L_{Aeq,16hr}$ (dB)	Initial Noise Risk Assessment (Daytime)	Night-time Ambient Noise Level $L_{Aeq,8hr}$ (dB)	Initial Noise Risk Assessment (Night-time)
MP1	70	Medium	64	High
MP2	57	Low	50	Low

Table 6.1: Initial Site Risk Assessment

The results of the initial site risk assessment based on the measured noise levels indicate that the site has a *high* risk in terms of noise.

Although industrial sources to the rear of the development, the noise levels are dominated by RTN on the local road network.

The initial site risk assessment can therefore conclude that the site has a *high* risk in terms of noise.

The pre-application advice associated with this risk category is:

High: 'High noise levels indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed Acoustic Design Statement (ADS). Applicants are strongly advised to seek expert advice.'

7. Full ProPG Residential Assessment

7.1. Good Acoustic Design

Good acoustic design has been shown by careful consideration of the building envelope construction.

7.2. Internal Noise Level Assessment – Background Ventilation Conditions

Note 5 of **Table 4.2** suggests that internal noise levels should ideally be achieved in as many properties as possible with windows open. Due to the relatively high noise levels present at the site, those habitable rooms on the majority of facades and elevations will not be able to achieve the requirement with windows open, and therefore the sound insulation of the building façade will be required to mitigate noise levels. We note that this does not necessitate that the windows be sealed shut but requires that an alternate primary means of ventilating the properties is provided (as defined by the Building Regulations Approved Document F). In carrying out our assessment, Syntegra have therefore made the following assumptions:

- The façade build-up will be a standard brick and block construction (or equivalent) to achieve an R_w of approximately 55 dB.
- For the front façade with a line of sight to London Street:
 - A double-glazing system in a 4/180/6 configuration with absorbant reveals, tightly closed (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 38 dB R_w .
 - An alternative means of ventilation will be installed to allow adequate background ventilation without the requirement to open windows.
 - Purge ventilation (as defined by ADF) through open windows.
 - MVHR System to be installed to provide mitigation for overheating.
- For the rear façade and side windows with no line of sight to London Road:
 - A typical double-glazing system in a 4/16/4 configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 28 dB R_w .
 - Appropriately specified acoustic trickle vents, with a $D_{n,e,w}$ of at least 34 dB, will be installed to allow adequate background ventilation without the requirement to open windows.
 - Purge ventilation (as defined by ADF) through open windows.
 - MVHR System to be installed to provide mitigation for overheating.

Table 7.1 identifies the likely L_{Aeq} and L_{Amax} internal noise levels, assuming windows closed, utilising the *Simple Calculation Method* described in BS 8233:2014. It can be seen that habitable rooms will achieve the requirements of the ProPG with closed windows.

Assessment Location	Period (hrs)	External Noise Levels (dB) (ref. Table 5.2)	Sound Reduction from Glazing (dBA)	Internal Noise Levels (dB)	ProPG Noise Level Criteria	Compliance with ProPG Criteria
Front Façade	Daytime $L_{Aeq,16hr}$ (0700 – 2300)	70	38	32	35	✓
	Night-time $L_{Aeq,8hr}$ (2300 – 0700)	64		26	30	
	Night-time L_{Amax} (2300 – 0700)	83		45	45	

Assessment Location	Period (hrs)	External Noise Levels (dB) (ref. Table 5.2)	Sound Reduction from Glazing (dBA)	Internal Noise Levels (dB)	ProPG Noise Level Criteria	Compliance with ProPG Criteria
Rear Façade	Daytime $L_{Aeq,16hr}$ (0700 – 2300)	60	28	32	35	✓
	Night-time $L_{Aeq,8hr}$ (2300 – 0700)	54		26	30	
	Night-time L_{Amax} (2300 – 0700)	72		44	45	

Table 7.1: Internal Noise Levels – Background Ventilation Conditions

7.3. Internal Noise Level Assessment – Overheating Conditions Screening Assessment

Table 7.2 identifies the likely night-time L_{Aeq} and L_{Amax} internal noise levels assuming windows open and identifies whether open windows are suitable for the mitigation of overheating.

Assessment Location	Period (hrs)	External Noise Levels (dB) (ref. Table 5.2)	Sound Reduction from Open Window (dBA)	Predicted Internal Noise Levels (dB)	ADO Noise Level Criteria (dB)	Open Windows Suitable for the Mitigation of Overheating
Front Façade	Night-time $L_{Aeq,8hr}$ (2300 – 0700)	64	15	49	40	X
	Night-time L_{Amax} (2300 – 0700)	83		68	55	
Rear Façade	Night-time $L_{Aeq,8hr}$ (2300 – 0700)	54	15	39	40	X
	Night-time L_{Amax} (2300 – 0700)	72		57	55	

Table 7.2: Internal Noise Levels – Overheating Conditions

7.4. External Noise Level Assessment

The site layout provided by the client indicates the location of terrace areas to the rear of the development.

The noise levels within the gardens have been predicted using the assessment noise levels in **Table 5.1** and are reproduced in **Table 7.3**.

The predicted noise levels are also compared against the ProPG criteria (lower guideline value 50 dB $L_{Aeq,16hr}$ and higher guideline value 55 dB $L_{Aeq,16hr}$) within **Table 7.3**.

5 dB attenuation has been applied to account for a balustrade around the terrace areas

Assessment Location	Predicted External Noise Levels $L_{Aeq,16hr}$ (dB) (ref. Appendix 4)	Compliance with Upper Guideline Criteria	Compliance with Lower Guideline Criteria
Rear Terraces	52	✓	X

Table 7.3: External Noise Levels

The balconies to the rear of the site are likely to experience noise levels of 52 dB $L_{Aeq,16hr}$. This is 2 dB higher than the lower guideline criteria set out in the ProPG (50 dB $L_{Aeq,16hr}$).

Residents would have access to nearby public amenity areas, such as Mountsfield Park (less than 500m from the site), which should partially off-set the relatively high noise levels on the balcony, in line with the advice provided in the ProPG.

The majority of amenity areas would experience lower noise levels (52 dB $L_{Aeq,16hr}$ or lower) which would readily achieve the lower guideline criteria set out in the ProPG (50 dB $L_{Aeq,16hr}$) and should therefore be acceptable acoustically.

7.5. Assessment of Other Relevant Issues

The assessment has shown that a reasonable internal noise environment can be achieved, in line with the requirements of the Local Authority, BS 8233 and the ProPG through careful consideration of the building envelope and ventilation requirements. Whilst it would be ideal to achieve the internal level criteria with open windows, it is common to achieve the criteria relying on closed windows in noisier areas. Such an approach is advocated in the PPG-Noise.

The assessment has also shown that the external noise level criteria would be achieved within most of the proposed amenity areas. Access to nearby public amenity areas can off-set the relatively loud noise environment on those proposed balconies.

Overall, it has been shown that, through careful consideration of the building envelope construction, the proposed development should avoid future residents being exposed to harmful levels of noise. It can therefore be concluded that significant adverse impacts on the health or quality of life of those future residents would be avoided, in line with the aims of the NPPF, NPSE and PPG-Noise.

8. Plant Noise Levels

8.1. Plant Noise Levels – Manufacturers Data

The plant noise levels have been obtained from manufacturers data sheet. A summary of the manufacturers noise levels are presented in **Table 8.1**. Detailed noise levels are presented in **Appendix 5**.

Plant Reference	Quoted Noise Level $L_{Aeq,T}$ (dB)	Quoted Distance from Source (m)	Calculated Sound Noise Level $L_{Aeq,T}$ at 1 m(dB)	Commentary
MRXBOX(AB)-ECO2	40	3	50	This is with the unit operating at 100%

Table 8.1: Plant Noise Levels

8.1.1. Plant Noise Levels – Penalties

The plant noise levels and operating conditions have been assessed by Syntegra in line with the advice provided within BS 4142:2014 and the following penalties will be added:

- Tonality: 0 dB (see **Appendix 5**)
- Impulsivity: 0 dB
- Noticeable feature (e.g. hum, whine, hiss): +3 dB for an audible hum due to the low frequency content of the noise (determined by the subjective method whilst on site).

The total penalty for the plant noise level features will therefore be +3 dB.

8.2. Receptor Noise Levels

The future plant noise levels at the nearest noise-sensitive receptors have been predicted using standard acoustic formulae based on the measured noise levels and are detailed in **Table 6.2** for the extract points.

	NSR
Sound Pressure Level at 1m from Source (L_{Aeq} dB)	50
Distance to Nearest Habitable Room Window (approx.)	7 m
Distance Correction (dB)	-17
Predicted Total Noise Level at Receptor (L_{Aeq} dB)	32

Table 8.2: Predicted Plant Noise Levels

9. Plant Noise Assessment (Planning Condition 19)

The background noise level and plant noise data presented in **Sections 5** and **8** has been utilised to determine the noise impact at the nearest noise-sensitive receptor when assessed using the methodology in BS 4142:2014.

The aim is to meet the requirements of the Local Authority's planning conditions which are:

- *The predicted specific sound level ($L_{Aeq,Tr}$) as measured at a point 1 metre external to the nearest noise-sensitive façade shall be at least 10 dB below the pre-existing background sound level, $L_{A90,T}$ when all plant/equipment (or any part of it) is in operation.*
- *The predicted rating level, $L_{Ar,Tr}$ (specific sound level plus any adjustment for the characteristic features of the sound) as measured at a point 1 metre external to the nearest noise-sensitive façade (habitable window of a dwelling) shall not exceed the pre-existing background sound level, $L_{A90,T}$ when all plant/equipment (or any part of it) is in operation.*

Table 9.1 below summarises the BS 4142 assessment procedure carried out for the site.

Results	Nearest Noise Sensitive Receptor (Day)	Nearest Noise Sensitive Receptor (Night)	Relevant Clauses of BS 4142:2014	Commentary
Measured Ambient Sound Level	57	50	7.3.2	Refer to Table 5.1
Residual Sound Level	57	50	7.3.3	<i>The ambient noise level without the plant operating.</i> Refer to Table 5.1
Typical Background Sound Level L_{A90} (dB)	55	41	8.1, 8.2	Refer to Table 5.1
Specific Sound Level	32		9.1, 9.2	Refer to Table 8.2
Acoustic Feature Correction	+3		9.2	Refer to Section 6.1.1
Rating Level L_{Ar} (dB)	35		9.1	Specific Sound Level + Acoustic Feature Correction
Excess of Rating over Background Sound Level	- 20	- 6	11	
	Assessment indicates a likelihood of a low impact	Assessment indicates a likelihood of a low impact	11	

Results	Nearest Noise Sensitive Receptor (Day)	Nearest Noise Sensitive Receptor (Night)	Relevant Clauses of BS 4142:2014	Commentary
	depending on context	depending on context		
Achievement of Local Authority Criteria	✓	x	n/a	10 dB below the existing L _{A90}

Table 9.1: BS 4142 Assessment

Table 9.1 identifies that an assessment in line with BS 4142 indicates that **the plant noise may cause a potential low impact upon the residents at the nearest noise-sensitive receptor, depending on context.**

During the night, the predicted rating level is 6 dB below the existing background noise level, which does not meet the local authority's criteria within planning condition 19 by 4 dB.

During the night, the predicted specific noise level is 9 dB below the existing background noise level, which does not meet the local authority's criteria within planning condition 19 by 1 dB.

During the day, the predicted rating level is 20 dB below the existing background noise level, which meets the local authority's criteria within planning condition 19.

During the day, the predicted specific noise level is 23 dB below the existing background noise level, which meets the local authority's criteria within planning condition 19.

9.1. Context of the Noise Source

BS 4142 advises that the "context" of the noise needs to be considered to determine the results of the assessment.

During the night, the predicted rating level is 6 dB below the existing background noise levels and 15 dB below the existing ambient noise levels. The addition of the new plant will not increase the ambient noise level and will not be audible above existing background noise levels

In consideration of the context of the noise source, the plant would not be expected to cause and adverse impacts on the health or quality of life of the nearest noise-sensitive receptors.

9.2. Consideration of Uncertainty

The assessment has considered uncertainty by taking a cautious approach in terms of the likely noise levels from the activities and by taking conservative losses for the distance attenuation. The cautious approach means that the noise impact is more likely to be overstated, as opposed to understated, although it is not likely that the predicted noise levels would be significantly different from those stated within the report. Overall, it is unlikely that the conclusions of the assessment would be changed as a result of any uncertainty in the assessment process.

9.3. Plant Noise Mitigation

Calculations have shown that 4 dB of attenuation is required to meet the requirements of planning condition 19.

The following mitigation options are possible, with the most likely being duct attenuation.

9.3.1. Replacement of Plant

If it is possible, the plant could be replaced with a unit that operates 4 dB lower than the proposed unit.

9.3.2. Operational Settings

A potential noise mitigation option would be to review the operational settings of the plant.

It is possible that the extract fans may be controllable by a frequency inverter, it may be that a change to the operational settings of the plant can assist in reducing the noise levels.

9.3.3. Duct Attenuation

Duct attenuation such as silencers and turning vanes can also be installed within the duct which may assist in reducing the levels of breakout sound through the walls of the duct as well as the sound emitted from the extract termination.

The installation of turning vanes in the bends should also assist in keeping the airflow smooth and therefore reduce turbulence.

10. Internal Sound Level (Planning Condition 20)

Planning Condition 20 states:

“If a Risk Overheating assessment recommends opening windows for a significant period for comfort cooling purposes and this will lead to an internal noise level increase of 5 dBA or greater above BS 8233:2014 recommended internal levels, the scheme shall include provision of alternative mechanical ventilation with minimum performance equivalent to a mechanical heat recovery (MVHR) system with cool air bypass as an alternative means of cooling and ventilation.

Noise from the system should not result in BS8233:2014 internal levels being exceeded. Thereafter, the development shall not be carried out other than in accordance with the approved scheme which shall be completed before any part of the accommodation hereby approved is occupied, unless the Local Planning Authority otherwise agrees in writing and shall be retained in accordance with such measures thereafter.”

A MVHR system has been advised as an alternative means of ventilation; therefore, an assessment of internal noise levels with the system in operation needs to be conducted.

10.1. Mechanical Ventilation (Max Noise Level)

Mechanical ventilation is to be utilised; the total indoor ambient noise level must not exceed the criteria identified in **Table 4.2** with windows closed. This includes contributions from both the external noise break-in and the mechanical noise of the MVHR system.

The assessment is based on the maximum noise break in level of the worst-affected façade.

The maximum noise level from mechanical systems is provided in **Table 10.1**.

Upper limit for the indoor ambient noise level (dB) with windows closed	Predicted Internal (dB) from noise break-in through closed windows	Permitted noise level from mechanical ventilation system L _{Aeq} (dB) in Each Room
45 L _{Amax}	45 L _{Amax}	35 dB

Table 10.1: Mechanical Ventilation Maximum Noise Levels

10.2. Internal Ambient Noise Level with MVHR System in Use

Using drawings supplied by the client of the MVHR system, the internal ambient noise level with the MVHR system in use can be predicted.

The calculation below shows a sample of rooms within the new residential dwellings. A sample of rooms has been selected as a worst case due to the length of ducting and bends from the MHVR unit. Full calculations of internal noise levels with the MVHR system in use are provided in **Table 10.2**.

Room	Predicted Internal Noise Level with MHVR unit operational L_{Aeq} (dB)	Required Amount of Mitigation Required (dB)
Flat 3, Dining Room	53	18
Flat 5, Bedroom	60	25
Flat 18, Bedroom	49	14

Table 10.2: Calculated Internal Noise Levels

Calculations have shown that 25 dB of attenuation is required to meet the requirements of planning condition 20.

Ideally, in-line duct attenuators should be installed in the system to ensure that the internal noise levels when the MVHR system is in use do not exceed the internal noise levels in **Table 4.2**.

11. Conclusion

An assessment has been carried out of the present noise climate at **43 London Street, Reading, RG1 4PS** and the impact of that noise on the proposed development.

The assessment is based on the results of a noise measurement survey that has been carried out over a five-day period at the proposed development site and has considered the advice of local and national planning policy and best practice guidance.

The initial site risk assessment identified that the site has a *high* risk in terms of noise.

Good acoustic design has been shown by careful consideration of the building envelope construction.

It has been identified that the requirements of the Local Authority in respect of internal noise levels can only be achieved through careful consideration of the building envelope. We note that this does not necessitate that the windows be sealed shut but requires that an alternate primary means of ventilating the properties is provided (as defined by the Building Regulations Approved Document F). The construction assumptions that have led to this conclusion are:

- **The façade build-up will be a standard brick and block construction (or equivalent) to achieve an R_w of approximately 55 dB.**
- **For the front façade with a line of sight to London Street:**
 - **A double-glazing system in a 4/180/6 configuration with absorbent reveals, tightly closed (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 38 dB R_w .**
 - **An alternative means of ventilation will be installed to allow adequate background ventilation without the requirement to open windows.**
 - **Purge ventilation (as defined by ADF) through open windows.**
 - **MVHR System to be installed to provide mitigation for overheating.**
- **For the rear façade and side windows with no line of sight to London Road:**
 - **A typical double-glazing system in a 4/16/4 configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 28 dB R_w .**
 - **Appropriately specified acoustic trickle vents, with a $D_{n,e,w}$ of at least 34 dB, will be installed to allow adequate background ventilation without the requirement to open windows.**
 - **Purge ventilation (as defined by ADF) through open windows.**
 - **MVHR System to be installed to provide mitigation for overheating.**

The assessment has also shown that the external noise level criteria would be achieved within most of the proposed amenity areas. Access to nearby public amenity areas can off-set the relatively loud noise environment in those proposed amenity areas.

Additionally, an assessment of plant noise has been carried out and it has been identified that adverse impacts can easily be avoided, assuming the criteria identified within this report are achieved.

Overall, it has been shown that, through careful consideration of the building envelope construction, the proposed development should avoid future residents being exposed to harmful levels of noise.

It can therefore be concluded that significant adverse impacts on the health or quality of life of those future residents would be avoided, in line with the aims of the NPPF, NPSE and PPG-Noise.

12. Appendix 1: Glossary of Acoustic Terminology

Term	Description
'A'-Weighting	<i>This is the main way of adjusting measured sound pressure levels to take into account human hearing, and our uneven frequency response.</i>
Decibel (dB)	<i>This is a tenth (deci) of a bel. The decibel can be a measure of the magnitude of sound, changes in sound level and a measure of sound insulation. Decibels are not an absolute unit of measurement but are an expression of ratio between two quantities expressed in logarithmic form.</i>
$L_{Aeq,T}$	<i>The equivalent steady sound level in dB containing the same acoustic energy as the actual fluctuating sound level over the given period, T. T may be as short as 1 second when used to describe a single event, or as long as 24 hours when used to describe the noise climate at a specified location. $L_{Aeq,T}$ can be measured directly with an integrating sound level meter.</i>
L_{A10}	<i>The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 10 per cent of a given time and is the L_{A10T}. The L_{A10} is used to describe the levels of road traffic noise at a particular location.</i>
L_{A50}	<i>The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 50 per cent of a given time and is the L_{A50T}.</i>
L_{A90}	<i>The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 90 per cent of a given time and is the L_{A90T}. The L_{A90} is used to describe the background noise levels at a particular location.</i>
L_{Amax}	<i>The 'A'-weighted maximum sound pressure level measured over a measurement period.</i>

13. Appendix 2: Professional Statement

Stephen Hale BSc (Hons), MIOA

Stephen Hale is a respected full member of the Institute of Acoustics (MIOA) and holds a Bachelor of Science degree in Sound Engineering with honours, backed by a decade of experience in the field of acoustics.

Specialising in environmental noise measurement, Stephen excels in providing expert acoustic consultancy services for residential and mixed-use planning applications, managing plant noise for large-scale industrial projects, and contributing to the innovative design of music studios.

Additionally, Stephen offers valuable expertise in sound insulation testing and design advisory.

14. Appendix 3: List of Equipment

Equipment Type	Manufacturer	Serial Number	Calibration Certification Number	Date of Last Calibration Check
SV307A Sound Level Meter	Svantek	116136	TCRT24/1724	September 2024
ST30A Microphone	Svantek	114596	TCRT24/1724	September 2024
NL-52 Type 1 Sound Level Meter	Rion	00586904	UCRT23/1873	July 2023
UC-59 Microphone	Rion	13361	UCRT23/1873	July 2023
NH-25 Preamplifier	Rion	87023	UCRT23/1873	July 2023
NC-75 Sound Calibrator	Rion	34334835	UCRT24/1569	July 2024

15. Appendix 4: Detailed Noise Measurement Results

Measured Noise levels – MP1 – Thursday

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
11:00-12:00	68	95	69	66
12:00-13:00	69	88	71	67
13:00-14:00	68	89	69	67
14:00-15:00	70	99	73	67
15:00-16:00	69	102	69	67
16:00-17:00	72	98	76	67
17:00-18:00	69	90	70	66
18:00-19:00	67	93	69	66
19:00-20:00	68	82	68	66
20:00-21:00	66	97	67	64
21:00-22:00	67	103	69	62
22:00-23:00	71	91	65	62
23:00-00:00	62	80	62	61
07:00-23:00	69	94	70	66
23:00-07:00	62	80	62	61

Measured Noise levels – MP1 - Friday

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
00:00-01:00	62	80	63	56
01:00-02:00	59	78	62	53
02:00-03:00	58	87	60	52
03:00-04:00	58	81	61	55
04:00-05:00	61	82	63	58
05:00-06:00	72	103	75	64
06:00-07:00	67	87	68	67
07:00-08:00	68	91	69	66
08:00-09:00	72	86	69	66
09:00-10:00	68	90	68	66
10:00-11:00	72	104	72	66
11:00-12:00	68	96	69	67
12:00-13:00	70	97	73	67
13:00-14:00	70	103	71	66
14:00-15:00	75	108	80	67
15:00-16:00	70	102	70	66
16:00-17:00	71	95	71	67
17:00-18:00	69	90	70	67
18:00-19:00	68	93	69	67
19:00-20:00	68	89	71	66
20:00-21:00	67	94	69	66
21:00-22:00	67	89	68	63
22:00-23:00	66	99	67	62
23:00-00:00	64	95	66	59
07:00-23:00	70	95	70	66
23:00-07:00	65	87	65	58

Measured Noise levels – MP1 – Saturday

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
00:00-01:00	62	77	65	57
01:00-02:00	60	87	62	56
02:00-03:00	60	78	61	56
03:00-04:00	59	82	61	54
04:00-05:00	61	86	63	58
05:00-06:00	63	84	64	61
06:00-07:00	65	85	66	63
07:00-08:00	65	91	66	64
08:00-09:00	76	86	82	66
09:00-10:00	67	88	68	65
10:00-11:00	68	100	72	66
11:00-12:00	71	90	73	66
12:00-13:00	70	111	70	65
13:00-14:00	79	94	75	65
14:00-15:00	70	96	72	66
15:00-16:00	70	100	70	67
16:00-17:00	69	92	70	66
17:00-18:00	68	88	69	66
18:00-19:00	68	98	68	65
19:00-20:00	70	89	75	65
20:00-21:00	67	98	68	64
21:00-22:00	69	97	71	64
22:00-23:00	69	105	67	63
23:00-00:00	67	83	67	60
07:00-23:00	71	95	71	65
23:00-07:00	63	83	64	58

Measured Noise levels – MP1 – Sunday

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
00:00-01:00	62	80	63	59
01:00-02:00	60	83	62	58
02:00-03:00	61	86	64	55
03:00-04:00	60	84	62	58
04:00-05:00	59	84	62	55
05:00-06:00	60	83	63	58
06:00-07:00	61	79	63	60
07:00-08:00	62	87	64	63
08:00-09:00	65	83	67	64
09:00-10:00	66	102	67	64
10:00-11:00	69	96	74	65
11:00-12:00	67	94	68	66
12:00-13:00	68	101	69	66
13:00-14:00	70	91	72	66
14:00-15:00	70	103	71	66
15:00-16:00	69	96	71	65
16:00-17:00	69	101	70	66
17:00-18:00	70	94	69	65
18:00-19:00	68	94	69	65
19:00-20:00	67	87	69	64
20:00-21:00	66	82	67	63
21:00-22:00	64	86	66	61
22:00-23:00	62	81	64	57
23:00-00:00	61	84	63	56
07:00-23:00	68	92	68	64
23:00-07:00	61	83	63	57

Measured Noise levels – MP1 – Monday

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
00:00-01:00	58	82	61	52
01:00-02:00	58	76	61	51
02:00-03:00	55	83	59	52
03:00-04:00	57	104	61	53
04:00-05:00	70	84	68	60
05:00-06:00	64	87	65	63
06:00-07:00	67	82	68	66
07:00-08:00	67	87	68	66
08:00-09:00	67	85	68	65
09:00-10:00	68	94	68	66
07:00-23:00	67	88	68	66
23:00-07:00	64	85	63	57

Measured Noise levels – MP2 – Thursday

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
12:00-13:00	60	83	62	59
13:00-14:00	61	83	62	59
14:00-15:00	60	84	60	58
15:00-16:00	61	84	63	59
16:00-17:00	59	83	60	58
17:00-18:00	59	79	61	57
18:00-19:00	59	77	60	58
19:00-20:00	59	80	59	58
20:00-21:00	58	76	58	57
21:00-22:00	56	74	57	55
22:00-23:00	57	86	56	51
23:00-00:00	51	65	53	49
07:00-23:00	59	81	60	57
23:00-07:00	51	65	53	49

Measured Noise levels – MP2 – Friday

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
00:00-01:00	50	68	51	47
01:00-02:00	51	72	54	48
02:00-03:00	47	59	48	44
03:00-04:00	45	63	46	44
04:00-05:00	48	80	51	44
05:00-06:00	50	73	53	47
06:00-07:00	53	78	55	50
07:00-08:00	53	75	54	52
08:00-09:00	56	79	57	53
09:00-10:00	56	79	58	54
10:00-11:00	56	72	58	55
11:00-12:00	60	84	61	57
12:00-13:00	58	72	58	56
13:00-14:00	59	83	60	57
14:00-15:00	58	77	59	57
15:00-16:00	59	86	61	56
16:00-17:00	58	80	60	57
17:00-18:00	60	79	62	58
18:00-19:00	60	87	61	58
19:00-20:00	59	81	59	58
20:00-21:00	58	79	59	57
21:00-22:00	57	70	57	56
22:00-23:00	55	79	57	53
23:00-00:00	53	75	54	52
07:00-23:00	58	79	59	56
23:00-07:00	50	71	51	47

Measured Noise levels – MP2 – Saturday

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
00:00-01:00	52	71	53	50
01:00-02:00	50	71	50	49
02:00-03:00	48	66	49	46
03:00-04:00	47	66	49	46
04:00-05:00	49	74	51	47
05:00-06:00	50	76	51	48
06:00-07:00	52	75	53	50
07:00-08:00	52	70	53	52
08:00-09:00	54	67	55	53
09:00-10:00	55	75	56	54
10:00-11:00	55	66	55	54
11:00-12:00	56	78	58	54
12:00-13:00	59	79	60	56
13:00-14:00	60	81	61	59
14:00-15:00	61	89	63	59
15:00-16:00	58	75	60	55
16:00-17:00	57	79	59	55
17:00-18:00	58	77	58	57
18:00-19:00	58	81	59	57
19:00-20:00	58	74	59	57
20:00-21:00	58	75	59	57
21:00-22:00	57	69	58	56
22:00-23:00	56	75	57	55
23:00-00:00	56	74	56	55
07:00-23:00	57	76	58	56
23:00-07:00	51	72	52	49

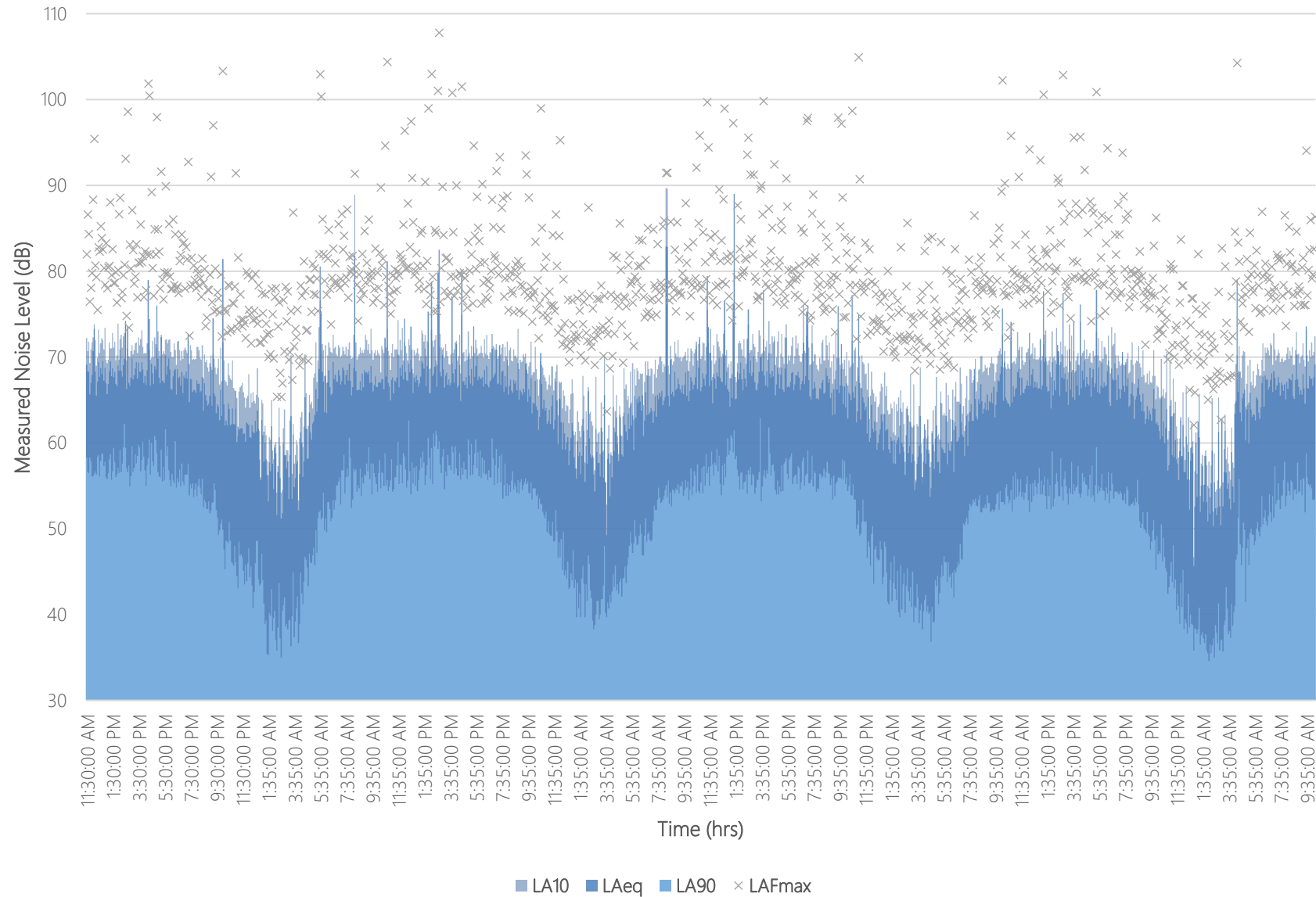
Measured Noise levels – MP2 – Sunday

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
00:00-01:00	55	83	56	54
01:00-02:00	50	69	51	48
02:00-03:00	48	63	50	46
03:00-04:00	48	64	49	46
04:00-05:00	47	69	47	45
05:00-06:00	47	71	48	46
06:00-07:00	54	69	56	48
07:00-08:00	55	64	56	55
08:00-09:00	56	77	56	55
09:00-10:00	56	69	57	56
10:00-11:00	56	73	57	56
11:00-12:00	57	74	58	56
12:00-13:00	58	71	60	56
13:00-14:00	57	86	58	56
14:00-15:00	58	80	60	57
15:00-16:00	56	81	59	53
16:00-17:00	55	75	55	52
17:00-18:00	57	74	57	55
18:00-19:00	56	79	58	55
19:00-20:00	56	74	57	55
20:00-21:00	56	73	57	55
21:00-22:00	55	74	55	54
22:00-23:00	55	67	56	54
23:00-00:00	49	63	50	45
07:00-23:00	56	74	57	55
23:00-07:00	51	69	51	47

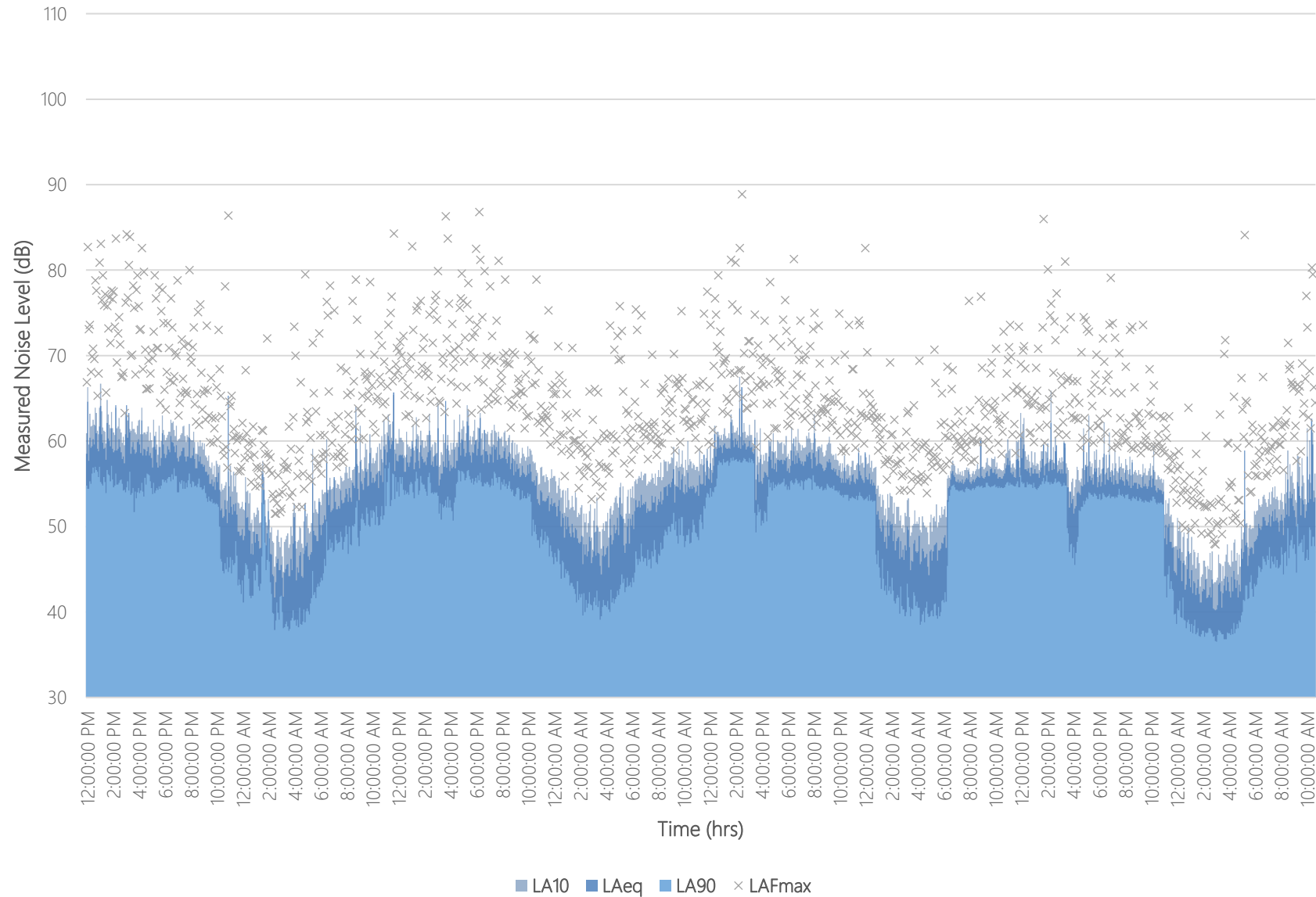
Measured Noise levels – MP2 - Monday

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
00:00-01:00	46	64	47	43
01:00-02:00	43	59	44	41
02:00-03:00	42	61	44	41
03:00-04:00	42	72	44	40
04:00-05:00	43	65	44	42
05:00-06:00	50	84	48	46
06:00-07:00	50	68	51	48
07:00-08:00	51	62	52	50
08:00-09:00	52	72	54	51
09:00-10:00	53	69	55	51
10:00-11:00	56	80	59	52
07:00-23:00	54	71	55	51
23:00-07:00	47	67	46	43

MP1 Measured Noise Levels from 1130 hrs on 26/06/2025 to 1600 hrs on 30/06/2025

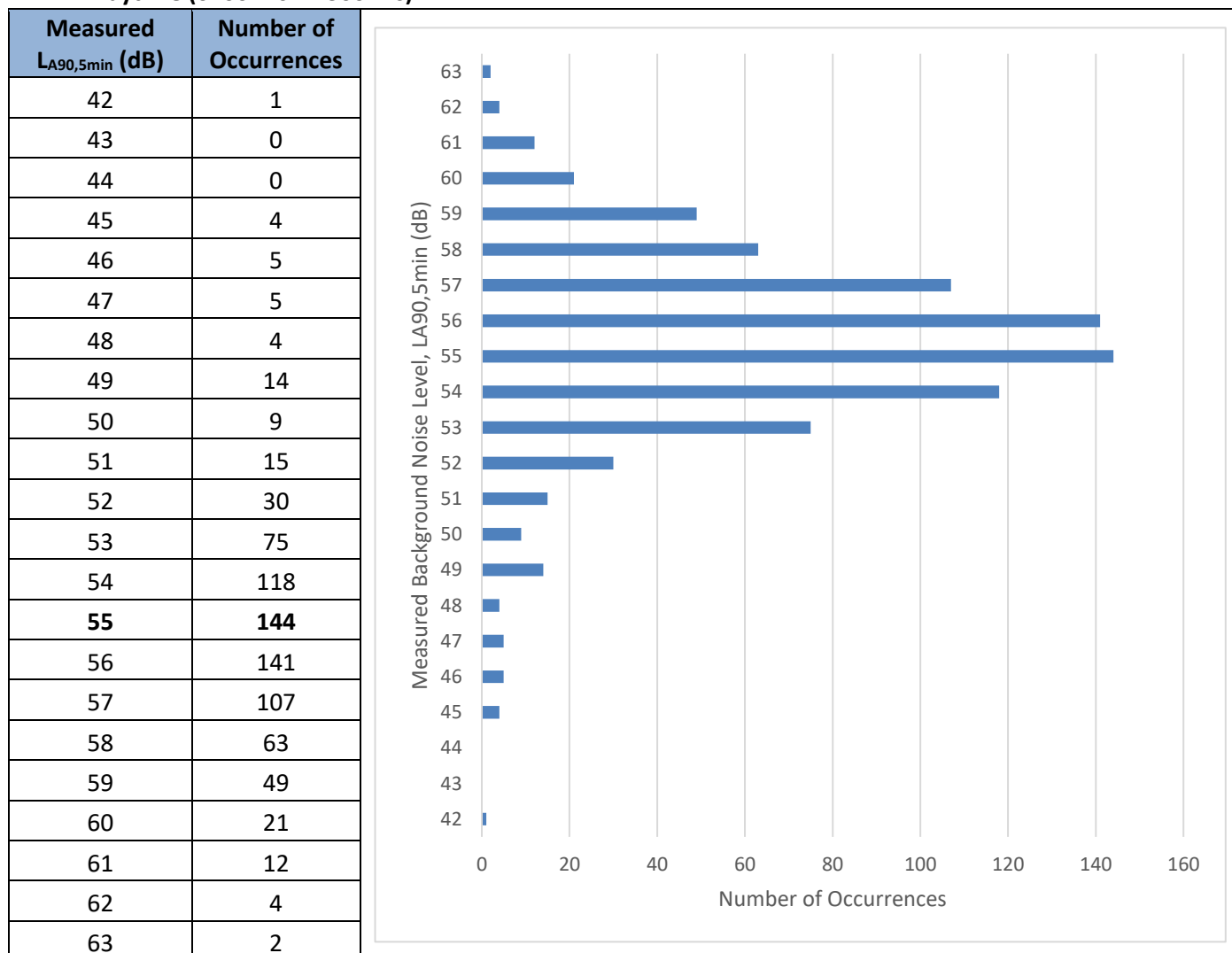


MP2 Measured Noise Levels from 1200 hrs on 26/06/2025 to 1625 hrs on 30/06/2025



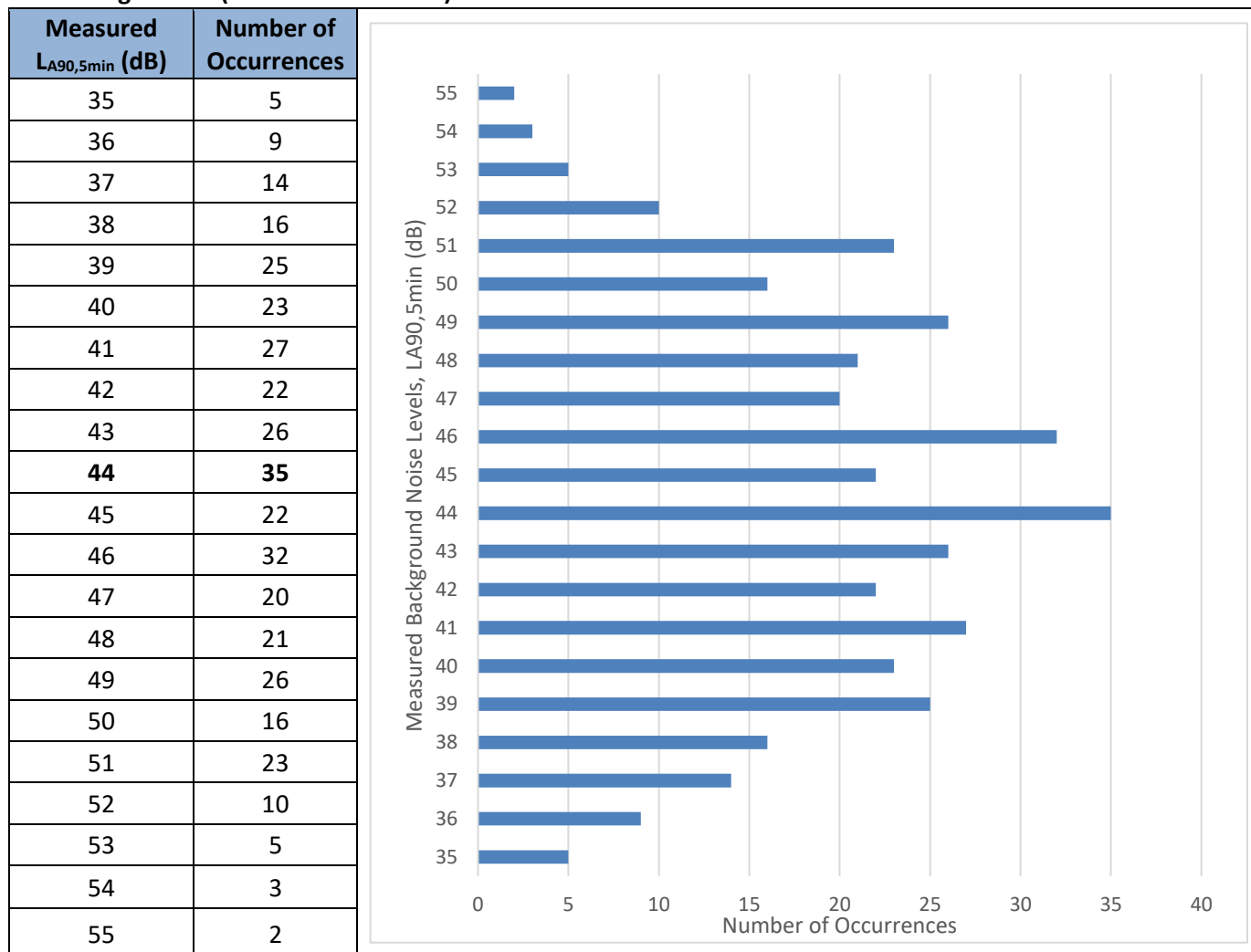
15.1. Typical Background Noise Level Analysis for BS 4142:2014 Assessment

MP1 - Daytime (0700 hrs – 2300 hrs)



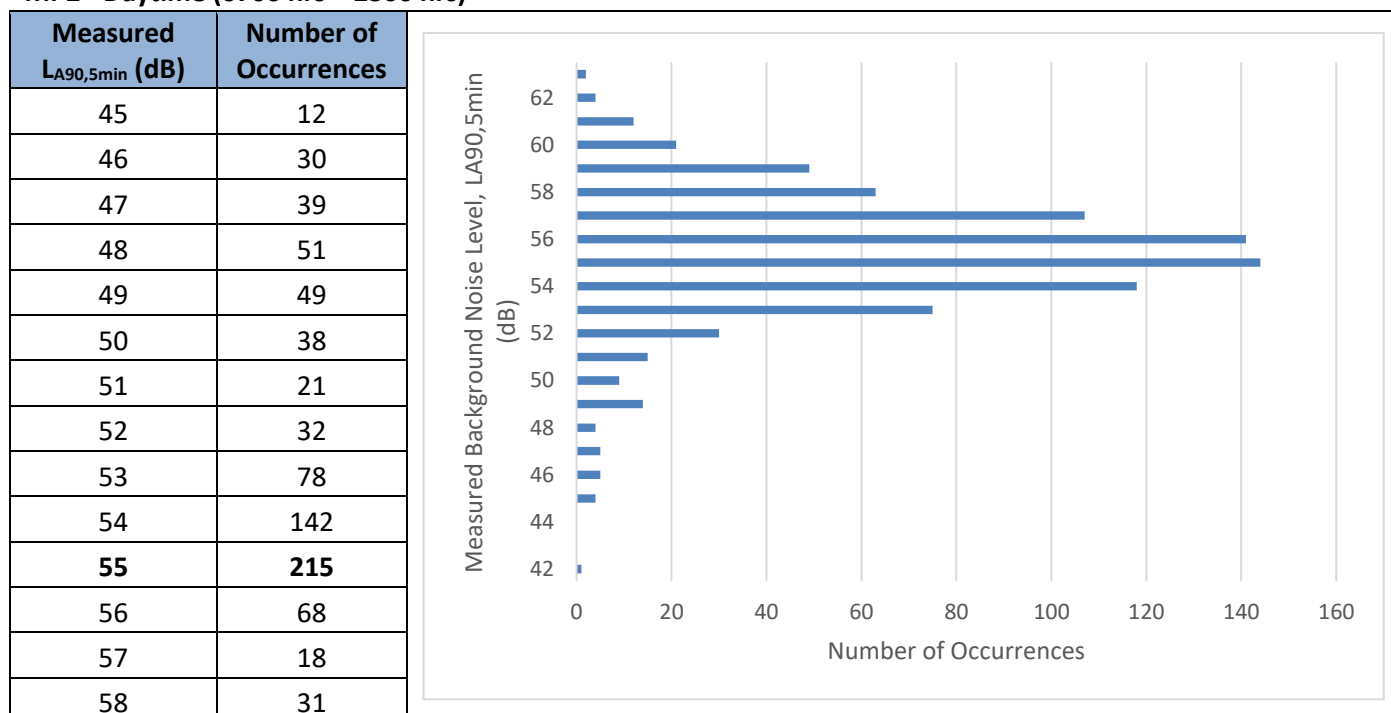
Note: The row marked in bold is the chosen Typical L_{A90} for the BS 4142 plant noise assessment.

MP1 - Night-time (2300 hrs – 0700 hrs)



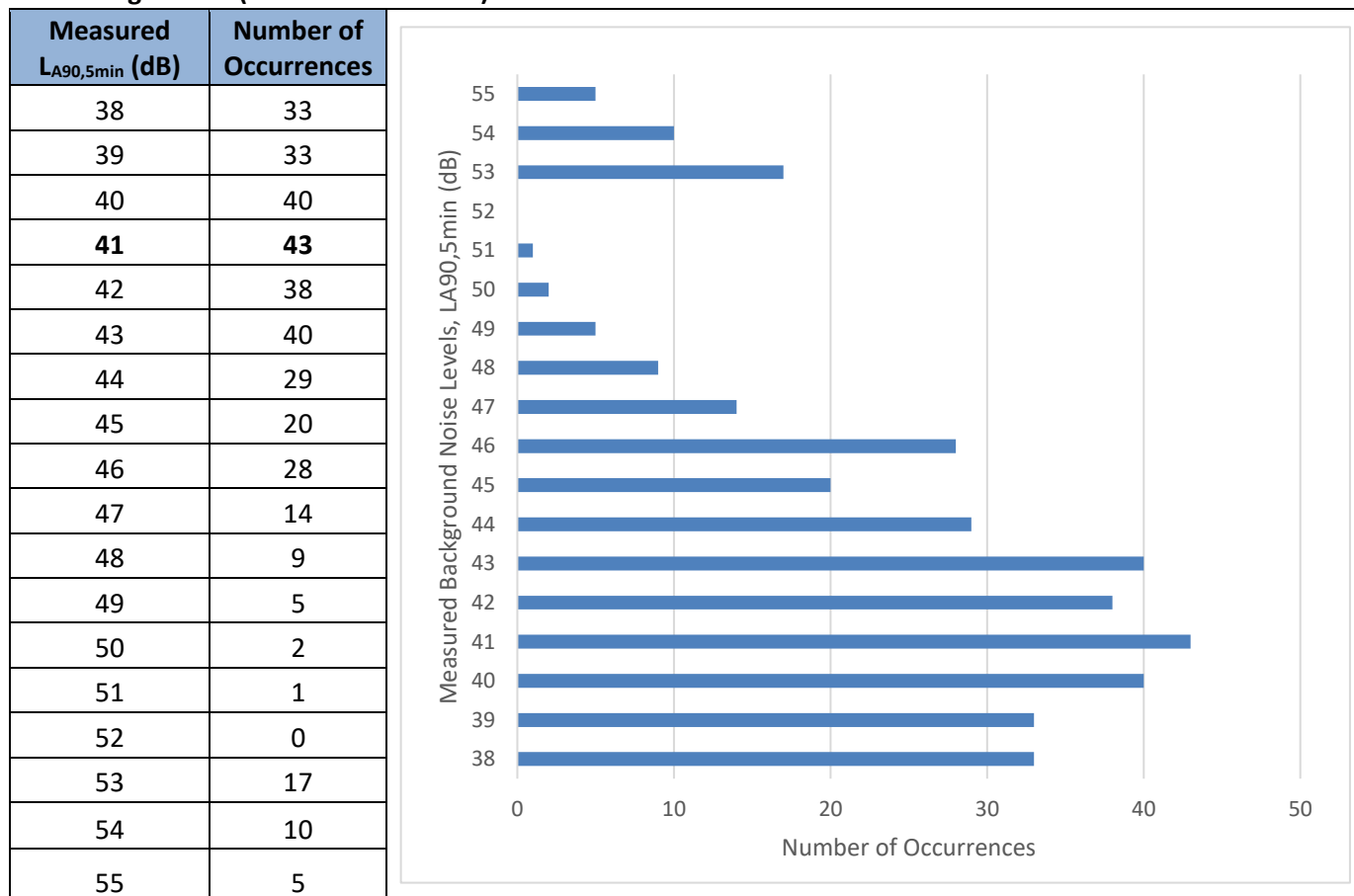
Note: The row marked in bold is the chosen Typical LA90 for the BS 4142 plant noise assessment.

MP2 - Daytime (0700 hrs – 2300 hrs)



Note: The row marked in bold is the chosen Typical LA90 for the BS 4142 plant noise assessment.

MP2 - Night-time (2300 hrs – 0700 hrs)



Note: The row marked in bold is the chosen Typical LA90 for the BS 4142 plant noise assessment

16. Appendix 5: Detailed Plant Noise Levels and Tonality Assessment of MRXBOX (AB) - ECO2 (Octave bands)

Operational Mode	Noise Levels (dB) in Octave Bands (Hz)								dB(A)
	63	125	250	500	1000	2000	4000	8000	
100%	60	67	69	69	64	64	54	46	40
75%	55	63	63	65	60	59	49	40	34
50%	48	54	53	55	49	47	35	24	24
25%	38	34	31	31	22	<16	<16	<16	<16

In order to assess tonality, the plant noise levels should be assessed using the 'Objective Method' detailed in BS4142:2014. The 'Objective Method' states: *"for a discrete tone to be identified as present, the time-averaged sound pressure level in the one-third-octave band of interest is required to exceed the time-averaged sound pressure levels of both adjacent one-third-octave bands by:*

- 15 dB in the low-frequency one-third-octave bands (25 Hz to 125 Hz);
- 8 dB in the middle-frequency one-third-octave bands (160 Hz to 400 Hz); and
- 5 dB in the high-frequency one-third-octave bands (500 Hz to 10 000 Hz)."

The 'Objective Method' for assessing tonality, as set out in BS 4142:2014, strictly requires one-third octave bands to determine tonality.

The octave band data presented does not indicate that any tones are likely to be present.