



Ian Sharland LIMITED

Noise & Vibration Control Specialists

Ashfield House
Back Lane
Marlborough
Wiltshire SN8 1JJ
Telephone: (01672) 515761
Email: office@iansharland.co.uk



**55 – 57 MARKET STREET
EASTLEIGH
HAMPSHIRE
SO50 5RF**

ENVIRONMENTAL NOISE ASSESSMENT FOR CONVERSION OF EXISTING BUILDING

v.1

Client:

BSZ PROPERTIES LIMITED

17 August 2026
Ref: M6091

CONTENTS

1. SUMMARY	2
2. INTRODUCTION	5
3. SURVEY OF EXISTING NOISE LEVELS	7
4. ASSESSMENT OF NOISE LEVELS	11
4.1 National Planning Policy Framework (December 2024)	11
4.2 National Policy Statement for England (March 2010)	12
4.3 Planning Practice Guide 'Noise' (July 2019)	14
4.4 Eastleigh Borough Council Local Plan	19
4.5 BS8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings	21
4.6 Approved Document O – Overheating	22
4.7 IOA/ANC Acoustics Ventilation and Overheating – Residential Design Guide	22
5. PRIMARY RECOMMENDATIONS FOR FAÇADE DESIGN	24
6. DESIGN FOR VENTILATION	26
7. ASSESSMENT OF KITCHEN EXTRACT FAN NOISE	27
8. INTERNAL SOUND INSULATION	29
FIGURE 1 – SITE LOCATION PLAN	32
FIGURE 2 – PROPOSED FLOOR PLANS	33
FIGURE 3 – MEASURED NOISE LEVELS, MARKET ST ELEVATION 1	34
FIGURE 4 – MEASURED NOISE LEVELS, MARKET ST ELEVATION 2	35
FIGURE 5 – MEASURED NOISE LEVELS, WELLS ROAD ELEVATION 1	36
FIGURE 6 – MEASURED NOISE LEVELS, WELLS ROAD ELEVATION 2	37
APPENDIX 1 – CALCULATIONS OF NOISE BREAK-IN	38
APPENDIX 2 – EXISTING SOUND INSULATION OF INTERNAL FLOOR	40
APPENDIX 3 – TERMINOLOGY RELATING TO NOISE	44

Project Reference	M6091
Issue No.	1
Author	Richard Sharland MA MSc CEng MIOA
Signature	
Reviewed e	Eddie Oxborough MSc MIOA
Signature	
Date	17 August 2026

This report has been prepared by Ian Sharland Ltd with all reasonable skill, care, and diligence, and taking account of the Services and the Terms agreed between Ian Sharland Ltd and the Client. This report is confidential to the client, and Ian Sharland Ltd accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known, unless formally agreed by Ian Sharland Ltd beforehand. Any such party relies upon the report at their own risk. Ian Sharland Ltd disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the Services.

1. SUMMARY

- 1.1 An assessment of environmental noise has been undertaken at 55 - 57 Market Street, Eastleigh, Hampshire, where the first floor of an existing commercial building will be converted to residential use.
- 1.2 It is proposed that the upper floor be converted to provide two flats, one overlooking Market Street, and one facing Wells road to the rear.
- 1.3 The existing ambient noise climate affecting the site has been established by means of a 6 day environmental noise survey (including weekend). This has captured both general noise in the locality, noise arising from road traffic to the front of the building, and plant/servicing traffic to the rear. The survey data has been used to predict the daytime and night-time levels affecting each part of the building.
- 1.4 Section 4 provides a description of the relevant national planning policies and defines the criteria which would commonly be applied to projects of this nature.
- 1.5 In order to comply with these requirements, the following replacement glazing and ventilation provisions have been recommended:

Element	Rooms	Specification
External walls	All	As existing, solid or cavity masonry
Glazing & Trickle Ventilation	Living Rooms, front Studio, rear ¹	27 dB $R_w + C_{tr}$, implying a 4 / 16 / 4 configuration. Trickle vents (if any) to be rated at 35 dB $D_{n,e,w}$, in the open position.
	Bedrooms, front	32 dB $R_w + C_{tr}$, implying a 4 / 10 / 10 configuration. Trickle vents (if any) to be rated at 40 dB $D_{n,e,w}$, in the open position.

Table 1.1 – Summary of Recommendations

- 1.6 The survey highlighted one particular item of building services plant, associated with the adjacent Subway outlet. Recommendations have been made for attenuating this fan, so that it becomes insignificant to the assessment (subject to third party agreements), or for upgrading the glazing to the rear facing Studio.
- 1.7 Section 6 also discusses the acoustic implications of providing higher rates of ventilation, Noting that Approved Document O would not apply to conversion projects, it is nonetheless recommended that consideration be given to the provision of mechanical ventilation for the habitable rooms within the development.

¹ Studio glazing to be upgraded to 32 dB $R_w + C_{tr}$ glazing, and 40 dB $D_{n,e,w}$ ventilators if adjacent kitchen extract fan is not attenuated

- 1.7 A parallel assessment of internal sound insulation between the ground and first floors has been conducted. Measurements of the existing performance indicate a value some 10 dB below the minimum requirements of the Building Regulations. At this stage, the nature of the likely Class E tenant is unknown. Therefore, recommendations have been given in terms of a minimum and maximum specification for the upgrade of the floor. Alternatively, the Client can provide the tenant with a Building Regulation compliant floor structure, and then ensure by contract that the tenant would be responsible for any physical upgrade (or operational noise management) to ensure that stated noise limits are not exceeded within the dwellings over.
- 1.8 With these provisions in place, it is confirmed that the acoustic amenity of the new occupiers can be assumed.

2. INTRODUCTION

- 2.1 An assessment of environmental noise has been undertaken at 55 - 57 Market Street, Eastleigh, Hampshire, on behalf of BSZ Properties Limited.
- 2.2 The mid-terrace property is located in the centre of the Eastleigh shopping area, and comprises a retail unit on the ground floor and office/storage on the first.
- 2.3 The surrounding area is a mixture of retail and residential. At the front, the building overlooks Market Street, a one-way shopping street (with no obvious licensed or late night venues evident in close proximity). At the rear, the building faces to Wells Road, and the rear loading areas of retail units on The High Street, beyond that (see Figure 1).



Front View:



Rear View:

- 2.4 The view of the rear of the property highlights the fact that the first floor of the building is set to the front, and that there is a long ground floor 'extension' projecting towards Wells Road. This provides a significant degree of separation of the rear residential elevation from activity on Wells Road.
- 2.5 The mainline railway linking Southampton and London lies 100m to the east, and end of the runway at Southampton Airport is c.1/2 miles to the south-east.
- 2.6 It is proposed that the first floor of the building be converted to provide two studio flats. The ground floor will retain Class E use (see Figure 2).
- 2.7 Concern has been expressed whether environmental noise sources may have adverse effects on new residential occupiers.
- 2.8 Ian Sharland Limited has therefore been commissioned to investigate the current situation and this report will:
- (i) Describe a survey of ambient noise levels on the site.
 - (ii) Confirm the required noise targets within the new dwellings, and hence the sound insulation performance required through the facades.
 - (iii) Describe a suitable form of glazing (et al.) to achieve this requirement.
 - (iv) Discuss the adjacent commercial activities and the need for specific acoustic protection.

3. SURVEY OF EXISTING NOISE LEVELS

- 3.1 The first step in determining the existing ambient noise level was to conduct a survey of noise affecting the site.
- 3.2 Surveys were conducted at the front and rear of the building, over two extended periods – Monday 27th July to Wednesday 29th July 2026, and Wednesday 12th August to Monday 17th August 2026.
- 3.3 A Rion NL52 sound level meter was set up on the front elevation of the building , with the microphone projected 1m in front of a first floor window. A second Rion NL52 sound level meter was then set up on the first floor flat roof, immediately next to the rear elevation, with microphone on a tripod 1.5m above floor level.
- 3.4 The equipment was configured to measure 5-minute samples of the following acoustic parameters:
- | | |
|---------------------|---|
| L _{Aeq} | The A-weighted equivalent continuous sound pressure level which, over the sample period, contains the same acoustic energy as the time-varying signal being recorded. |
| L _{Amax,f} | The A-weighted maximum sound pressure level recorded during each sample period (as measured on fast response). |
| L _{A90} | A statistical parameter, representing the A-weighted noise level exceeded for 90% of each sample period. This gives a measure of the underlying noise, and is commonly used to describe the ambient background noise. |
- 3.5 The equipment was calibrated before and after the survey and showed no significant variance.
- 3.6 Weather conditions during the survey were as follows:

Date	Ave Temp °C	Events	Ave Wind Speed m/s	Prevailing Wind Direction
Mon 27/7/26	24	None	3.5	S
Tue 28/7/26	24	None	2.6	Var
Wed 29/7/26	19	None	1.3	SW
Wed 12/8/26	21	None	2.6	SE
Thur 13/8/26	22	None	4.4	S / SE
Fri 14/8/26	22	None	1.8	E / NE
Sat 15/8/26	25	None	4.0	N
Sun 16/8/26	20	None	2.6	N / S
Mon 17/8/26	20	None	4.4	NW

Table 3.1 – Weather Conditions

- 3.7 Figures 3 - 6 indicate the variation in overall noise level across the survey periods at each monitoring position, and Table 3.2 summarises the day time and night time measures:

Period		Daytime L _{Aeq} , 16hrs	Nighttime L _{Aeq} , 8hrs	Typical Nighttime Peak L _{Amax} , fast
Front Elevation:				
Mon 27/7/26	dB(A)	58.8	50.0	70
Tue 28/7/26	dB(A)	57.6	51.7	73
Wed 29/7/26	dB(A)	59.6	51.8	76
Wed 12/8/26	dB(A)	61.0	61.5	73
Thur 13/8/26	dB(A)	59.0	62.1	76
Fri 14/8/26	dB(A)	60.3	52.3	74
Sat 15/8/26	dB(A)	62.4	51.4	71
Sun 16/8/26	dB(A)	58.9	49.6	71
Assessed Value	dB(A)	61	62	76

Contd. overleaf

Period		Daytime L _{Aeq} , 16hrs	Nighttime L _{Aeq} , 8hrs	Typical Nighttime Peak L _{Amax} , fast
Rear Elevation:				
Mon 27/7/26	dB(A)	52.9	50.3	68
Tue 28/7/26	dB(A)	56.9	50.6	72
Wed 29/7/26	dB(A)	57.8	51.1	70
Wed 12/8/26	dB(A)	51.4	51.6	71
Thur 13/8/26	dB(A)	54.6	52.4	70
Fri 14/8/26	dB(A)	57.6	51.1	68
Sat 15/8/26	dB(A)	59.1	49.2	58
Sun 16/8/26	dB(A)	57.5	50.2	68
Assessed Value	dB(A)	59	52	72

Table 3.2 – Summary of Measured Noise Levels, dB(A).

3.8 The figures in Table 3.2 represent all data captured by the sound level meters. There are some apparent anomalies which require some discussion, however.

- (i) On the front elevation, night time noise levels are generally some 8 - 10 dB lower than day time levels – as would be expected. On Wednesday 12th and Thursday 13th, however, noise levels are slightly higher at night. A review of the data indicates that, on the mornings of Thursday 13th and Friday 14th, between 06.00 and 06.30, there is a significantly raised period of noise. This might be typical of road cleaning or other servicing activity on Market Street. It is repeated, however, that the assessed value, to be used later in the design of the building, will reflect these raised levels.
- (ii) To the rear of the property, noise levels are very similar to those recorded at the front (excluding the aforementioned raise level). The noise climate is dominated, however, by ventilation plant associated with adjacent buildings. An inspection identifies a number of air conditioning plant on the roofs of buildings north and south, and on the buildings facing across Wells Road (some 50m away). Noise levels are relatively constant, at 50 dB(A) during day time and night periods, with occasional 10 dB(A) steps down (presumably when the A/C switches off).
- (iii) There are also noticeable steps up, by some 15 dB(A), occurring on most mornings for a period of 3 – 4 hours. Whilst the typical operation is from 08.30, on one occasion the noise lifted during the afternoon hours. Site inspections identified that the source of this uplift is a kitchen extract fan associated with the Subway store at 51 – 53 Market Street, immediately adjacent. This will be discussed further.

- (iv) During the site inspections, a lorry unloading to the rear of a store on high Street was witnessed. Whilst the lorry and the movement of pallet trucks was discernible when listening from outside the site, objective measurements were not changed from the steady 50 dB(A) measurements. Similarly, a review of the survey data does not identify any clear, short-term uplift in noise level during early mornings (typical delivery times), above the underlying plant noise levels.
- 3.9 The following sections of this report will discuss the significance of these levels, and the measures which should be included within the building design to mitigate any adverse effects.

4. ASSESSMENT OF NOISE LEVELS

4.1 National Planning Policy Framework (December 2024)

- 4.1.1 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally prepared plans for housing and other development can be produced.
- 4.1.2 Planning law requires that applications for planning permission be determined in accordance with the development plan unless material considerations indicate otherwise. The National Planning Policy Framework must be considered in preparing the development plan and is a material consideration in planning decisions. Planning policies and decisions must also reflect relevant international obligations and statutory requirements.
- 4.1.3 The purpose of the planning system is to contribute to the achievement of sustainable development. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs.
- 4.1.4 Paragraphs 187, 198 & 200 of the NPPF states:

***187.** Planning policies and decisions should contribute to and enhance the natural and local environment by:*

- (a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan).*
- (b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland.*
- (c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate.*
- (d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures and incorporating features which support priority or threatened species such as swifts, bats and hedgehogs.*
- (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; and*
- (f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.*

198. *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; and*
- c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

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

4.2 National Policy Statement for England (March 2010)

- 4.2.1 The document "Noise Policy Statement for England" sets out the following vision for on-going noise policy:

"Promote good health and quality of life through the effective management of noise within the context of Government policy on sustainable development."

- 4.2.2 This vision should be achieved through the following Noise Policy Aims:

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

- avoid significant adverse impacts on health and quality of life.*
- mitigate and minimise adverse impacts on health and quality of life.*
- and where possible, contribute to the improvement of health and quality of life".*

- 4.2.3 To achieve these objectives the Noise Policy Statement sets out three noise levels to be defined by the assessor:

- **NOEL** - No Observed Effect Level
This is the level below which no effect can be detected. In simple terms, below this level there is no detectable effect on health and quality of life due to the noise.
- **LOAEL** - Lowest Observed Adverse Effect Level
This is the level above which adverse effects on health and quality of life can be detected. Where levels lie between the LOAEL and SOAEL, the Statement requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development, as set out in the NPPF.
- **SOAEL** - Significant Observed Adverse Effect Level
This is the level above which significant adverse effects on health and quality of life occur. It notes, however, that "it is not possible to have a single objective noise-based measure that describes SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times".

4.2.4 Paragraph 2.7 states that "... the application of the NPSE should enable noise to be considered alongside other relevant issues and not to be considered in isolation. In the past, the wider benefits of a policy, development or other activity may not have been given adequate weight when assessing the noise implications".

4.2.5 This provides clear guidance that noise must not be considered in isolation but as part of the overall scheme, taking into account the overall sustainability and associated impacts of the proposed development; there is no benefit in reducing noise to an excessively low level if this creates or increases some other adverse impact. Similarly, it may be appropriate in some cases for noise to have an adverse impact if this is outweighed by the reduction or removal of some other adverse impact that is of greater significance to the development.

4.2.6 The Noise Policy Statement considers that noise levels above the SOAEL would be seen to have, by definition, significant adverse effects and would be considered unacceptable. Where the assessed noise levels fall between the LOAEL and the SOAEL noise levels, the Policy Statement requires that:

"all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also considering the guiding principles of sustainable development.... This does not mean that such adverse effects cannot occur."

4.2.7 Where noise levels are below the LOAEL it is considered there will be no adverse effect. Once noise levels are below the NOEL there will be no observable change. An indication of the numerical definition of LOAEL may be derived from the following guidance.

4.3 Planning Practice Guide 'Noise' (July 2019)

4.3.1 The Ministry of Housing Communities and Local Government provided further guidance to support the NPPF. The section, Noise, published in July 2019, provides the following advice:

When is noise relevant to planning?

Noise needs to be considered when development may create additional noise, or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced). When preparing plans, or taking decisions about new development, there may also be opportunities to make improvements to the acoustic environment. Good acoustic design needs to be considered early in the planning process to ensure that the most appropriate and cost-effective solutions are identified from the outset.

What are the observed effect levels?

- *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 or quality of life can be detected.*

Although the word 'level' is used here, this does not mean that the effects can only be defined in terms of a single value of noise exposure. In some circumstances adverse effects are defined in terms of a combination of more than one factor such as noise exposure, the number of occurrences of the noise in a given time period, the duration of the noise and the time of day the noise occurs.

How can it be established whether noise is likely to be a concern?

At the lowest extreme, when noise is not perceived to be present, there is by definition no effect. As the noise exposure increases, it will cross the 'no observed effect' level. However, the noise has no adverse effect so long as the exposure does not cause any change in behaviour, attitude or other physiological responses of those affected by it. The noise may slightly affect the acoustic character of an area but not to the extent there is a change in quality of life. If the noise exposure is at this level no specific measures are required to manage the acoustic environment.

As the exposure increases further, it crosses the 'lowest observed adverse effect' level boundary above which the noise starts to cause small changes in behaviour and attitude, for example, having to turn up the volume on the television or needing to speak more loudly to be heard. The noise therefore starts to have an adverse effect and consideration needs to be given to mitigating and minimising those effects (taking account of the economic and social benefits being derived from the activity causing the noise).

Increasing noise exposure will at some point cause the 'significant observed adverse effect' level boundary to be crossed. Above this level the noise causes a material change

in behaviour such as keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present. If the exposure is predicted to be above this level the planning process should be used to avoid this effect occurring, for example through the choice of sites at the plan-making stage, or by use of appropriate mitigation such as by altering the design and layout. While such decisions must be made taking account of the economic and social benefit of the activity causing or affected by the noise, it is undesirable for such exposure to be caused.

At the highest extreme, noise exposure would cause extensive and sustained adverse changes in behaviour and / or health without an ability to mitigate the effect of the noise. The impacts on health and quality of life are such that regardless of the benefits of the activity causing the noise, this situation should be avoided.

- 4.3.2 The table below summarises the noise exposure hierarchy, based on the likely average response:

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

Table 4.1 – Noise Exposure Hierarchy

4.3.3 The guidance further advises:

What factors influence whether noise could be a concern?

The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation.

These factors include:

- the source and absolute level of the noise together with the time of day it occurs. Some types and level of noise will cause a greater adverse effect at night than if they occurred during the day – this is because people tend to be more sensitive

to noise at night as they are trying to sleep. The adverse effect can also be greater simply because there is less background noise at night.

- for a new noise making source, how the noise from it relates to the existing sound environment.
- for non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise.
- the spectral content of the noise (i.e. whether or not the noise contains particular high or low frequency content) and the general character of the noise (i.e. whether or not the noise contains particular tonal characteristics or other particular features), and
- the local arrangement of buildings, surfaces and green infrastructure, and the extent to which it reflects or absorbs noise.

More specific factors to consider when relevant include:

- the cumulative impacts of more than one source of noise.
- whether any adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time (and the effect this may have on living conditions). In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations;
- In cases where existing noise sensitive locations already experience high noise levels, a development that is expected to cause even a small increase in the overall noise level may result in a significant adverse effect occurring even though little to no change in behaviour would be likely to occur.
- Noise Action Plans (where these exist), and, in particular the Important Areas identified through the process associated with the Environmental Noise Directive and corresponding regulations should be taken into account. Defra's website has information on Noise Action Plans and Important Areas. Local authority environmental health departments will also be able to provide information about Important Areas.
- the effect of noise on wildlife. Noise can adversely affect wildlife and ecosystems. Particular consideration needs to be given to the potential effects of noisy development on international, national and locally designated sites of importance for biodiversity.
- where 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.
- some commercial developments including restaurants, hot food takeaways, night clubs and public houses can have particular impacts, not least because activities are often at their peak in the evening and late at night. Local planning authorities will wish to bear in mind not only the noise that is generated within the premises but also the noise that may be made by customers in the vicinity.

When proposed developments could include activities that would be covered by the licensing regime, local planning authorities will need to consider whether the potential for adverse noise impacts will be addressed through licensing controls (including licence conditions). Local planning authorities should not however presume that licence conditions will provide for noise management in all instances and should liaise with the licensing authority.

Are there further considerations relating to mitigating the impact of noise on residential developments?

Noise impacts may be partially offset if residents have access to one or more of:

- a relatively quiet facade (containing windows to habitable rooms) as part of their dwelling.
- a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced if this area is exposed to noise levels that result in significant adverse effects.
- a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or
- a relatively quiet, protected, external publically accessible 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).

4.3.4 The noise impact on residential developments may be partially off-set if the residents of those dwellings have access to:

- *a relatively quiet facade (containing windows to habitable rooms) as part of their dwelling, and/or;*
- *a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced with increasing noise exposure and could be such that significant adverse effects occur, 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, external publically accessible 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).*

4.4 Eastleigh Borough Council Local Plan

4.4.1 The Eastleigh Borough Council Local Plan 2016 – 2036 (adopted April 2022) recognises the importance of ensuring new development does not adversely impact new or existing occupiers. Policy DM8, Pollution states:

1. *Development will not be permitted if it is likely to cause loss of amenity or impact on public health or other unacceptable environmental impacts through: a. air pollution (including odours or particulate emissions); b. pollution of surface, underground, coastal waters or other watercourses; c. noise or vibration; d. light intrusion, both generally and with respect to the South Downs National Park's status as an International Dark Night Skies reserve; or e. land contamination. 72 Eastleigh Borough Local Plan 2016-2036 April 2022*
2. *Development susceptible to particular forms of pollution will not be permitted:*
 - a. *where it will be adversely affected by such pollution, unless measures can be taken that adequately mitigate the polluting effects; or*
 - b. *where it would inhibit existing economic or other activities giving rise to acceptable polluting effects.*
3. *Where a development site is known or suspected to be contaminated, before the site is developed the Borough Council will require the contamination to be remediated to a standard where as a minimum it cannot be defined as 'contaminated land' under Part IIA of the Environmental Protection Act 1990*

4.4.2 The Plan further notes:

The adverse effects of exposure to excessive noise and vibration on health and quality of life are well documented and recognised as a material planning consideration. The Council supports the approach of the Noise Policy Statement for England in relation to the effective control of noise within the context of sustainable development. Any proposals likely to generate noise (including demolition and construction noise) will be expected to take account of the impact of this on any noise sensitive population, including those using recreational areas. Similarly, in assessing proposals for noise sensitive development, the Council will expect the developer to take into account existing noise levels and foreseeable changes to these. In doing so, developers must avoid significant adverse noise impacts to residential amenities. Development proposals should ensure that they mitigate and minimise adverse noise impacts and, where possible, contribute to the improvement of health and quality of life. Where necessary, the Council will require a noise assessment which will be expected to:

- *identify all significant sources of noise;*
- *assess the likely short and long term impacts of noise generated or exposure to noise; and*
- *propose noise protection measures.*

Wherever possible, developments should use site and building layout and design to manage levels of noise on development sites. Where acceptable internal noise levels cannot be met with open windows, alternative ventilation will be required. Where the development site is affected by air pollution in addition to noise, early consideration of the location of air ventilation inlets is recommended. The following standards will be used to assess the acceptability of development proposals affected by steady external noise sources: In respect of the Solent and Southampton Water SPA and Ramsar sites and supporting habitat, construction noise should be kept below 69dBA max either alone or in combination with other developments (measured at the sensitive receptor which is the nearest point of the SPA/Ramsar or supporting habitat) during the bird overwintering period, or works timed so that they do not coincide with the wintering bird season. Natural England will provide advice on a case by case basis where construction noise exceeds 69dBA max.

Standards for Maximum Ambient Noise Levels (in spaces when they are unoccupied) for Dwellings Subject to Transport-Related Noise			
Living Area	Night-Time (2300-0700) LAeq, 8hr	Daytime (0700-2300) LAeq, 16hr	Additional Requirements
Bedrooms	30	35	1. Individual noise events must not normally exceed 45 dB LAmax (measured with fast time-weighting) during the night time. 2. Provision of suitable means of sound attenuating ventilation to allow for the fact that opening windows will render noise insulation ineffective.
Living Rooms	-	35	Provision of suitable means of sound attenuating ventilation to allow for the fact that opening windows will render noise insulation ineffective.
Gardens ^a	-	55	Balconies will need to meet the same standard unless it is clear that they are not intended to be an outdoor living area, for example due to their small size.

Note – Levels based on Table 4 of BS8233:2014 Guidance on sound insulation and noise reduction for buildings. Where development site affected by non-steady noise source, commercial or industrial noise, or noise that does not follow a typical diurnal pattern, the acceptability of noise levels will be determined on a case by case basis.

a – This standard applies to main gardens (usually rear gardens) only, but not communal gardens.

4.5 BS8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings

- 4.5.1 There is much guidance on the levels of intrusive noise which would be considered acceptable within residential accommodation such as this. Typical advice is found in British Standard 82:2014 "Guidance on Sound Insulation and Noise Reduction for buildings". Following similar guidance in the 1999 World Health Organisation report "Guidelines for Community Noise", the Standard sets out the following limits for indoor ambient noise levels within living rooms and bedrooms of residential accommodation. This suggests:

Activity	Location	0700 - 2300	2300 - 0700
Resting	Living Room	35 dB(A) LAeq, 16 hr	-
Dining	Dining room/Area	40 dB(A) LAeq, 16 hr	-
Sleeping	Bedroom	35 dB(A) LAeq, 16 hr	30 dB(A) LAeq, 8 hr

Table 4.2 - BS82 Indoor Guideline Values

- 4.5.2 It is usually considered that an open window will provide a reduction of some 10-15 dB(A)². Therefore the 'good' internal standards quoted above would broadly equate to the following targets immediately outside the buildings:

Activity	Location	0700 - 2300	2300 - 0700
Resting	Living Room	48 dB(A) LAeq, 16 hr	-
Dining	Dining room/Area	53 dB(A) LAeq, 16 hr	-
Sleeping	Bedroom	48 dB(A) LAeq, 16 hr	43 dB(A) LAeq, 8 hr

Table 4.3 - BS82 Derived Facade Guideline Values

- 4.5.3 BS82 recognises that, where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB, and reasonable conditions will be achieved³.
- 4.5.4 It should be noted that the levels quoted in BS82 are intended to reflect the acceptability of steady, continuous noise. Sources of intermittent and tonal noise may generate greater annoyance for a similar overall magnitude. Whilst BS82 does not explicitly state a correction for those circumstances, it may be appropriate to consider that the Good and Reasonable standards would be achieved with levels which are perhaps 5 dB lower than stated in the table above.
- 4.5.5 It is also noted that BS82 was written from a view of designing new buildings to protect occupants from existing noise sources. This does necessarily infer, however, that the acceptability of an occupant to an absolute level noise within a building will be different if the introduction of the noise source post-dates the construction of the building.

² Reference PPG24 Planning & Noise, which adopted a mid-range value of 13 dB(A)

³ Note, the relaxation specified in BS82 must be read in conjunction with parallel guidance set out in Approved Document O.

4.6 Approved Document O – Overheating

- 4.6.1 Approved Document O Overheating describes the means by which designers can **protect the health and welfare of occupants of the building by reducing the occurrence of high indoor temperatures.**
- 4.6.2 The scope of the Document applies to new residential dwellings and institutions, and includes the following building types:

Title	Purpose for which the building is intended to be used
Residential (dwellings)	Dwellings, which includes both dwellinghouses and flats.
Residential (institutional)	Home, school or other similar establishment, where people sleep on the premises. The building may be living accommodation for the care or maintenance of any of the following. a. Older and disabled people, due to illness or other physical or mental condition. b. People under the age of 5 years.
Residential (other)	Residential college, hall of residence and other student accommodation, and living accommodation for children aged 5 years and older.

Table 4.4 – ADO Scope

- 4.6.3 In respect of the acoustic implications, the Document considers the acceptable limits for noise within bedrooms at night. This applies when the method of overheating control is active – whether that be an open window, passive vent or mechanical system. The noise limits are summarised below:
- a. 40dB $L_{Aeq,t}$, averaged over 8 hours (between 11pm and 7am).
 - b. 55dB $L_{Amax,f}$ more than 10 times a night (between 11pm and 7am).
- 4.6.4 Should an analysis of the external noise levels (for open windows/vents) indicate that these values will be exceeded, an alternative strategy should be adopted.

4.7 IOA/ANC Acoustics Ventilation and Overheating – Residential Design Guide

- 4.7.1 The Institute of Acoustic and Association of Noise Consultants have published the 'Acoustics Ventilation and Overheating – Residential Design Guide' (January 2020) to promote best practice in the design of residential buildings to control overheating in areas of high ambient noise.
- 4.4.2 When providing design targets inside the dwellings, the AVOG document advises that the internal noise standard of BS8233:2014 (as copied here in Table 5.1) should be achieved when providing adequate ventilation as defined in ADF. However, the document continues to

propose that it is considered reasonable to allow higher levels of internal ambient noise from transport sources when higher rates of ventilation are required in relation to the overheating condition.

- 4.7.3 This proposition is based on the fact that overheating will occur for only part of the time, during which there will be a trade-off between acoustic and thermal conditions, given that residents would have some control over their environment (a principle well established in the field of thermal comfort).
- 4.7.4 The guide indicates that the sound level difference across a façade, with standard opening windows, would be 13 dB(A), but that this figure may be greater if windows are shielded by balconies.
- 4.7.5 BS8233:2014 states that, if internal noise levels are no more than 5 dB greater than the levels shown here in Table 4.2, this would be a 'reasonable' standard. Therefore, if external noise levels do not exceed the following values when windows are open, conditions should be considered wholly acceptable, and therefore the threshold between No and Low Observed Adverse Effect Levels:

Location	0700 - 2300	2300 - 0700
Living Room	53 dB(A) LAeq, 16 hr	-
Bedrooms	53 dB(A) LAeq, 16 hr	48 dB(A) LAeq, 8 hr

Table 4.5 – Proposed LOAEL Façade Noise Levels with Windows Open

- 4.7.6 To consider the upper limit, beyond which internal conditions should not be deemed acceptable, reference is made to issue of speech interference. With reference to the numerical values in BS8233 (see Table 4.7 above), the AVOG document adopts an internal daytime limit of 50 dB(A), which would then equate to an external limit of 63 dB(A) when windows are open.
- 4.7.7 At night, reference is made to the WHO Night Noise Guidelines, which developed the original WHO Guidelines for Community Noise report. This states that if external noise levels exceed 55 dB(A) L_{Aeq} , 'adverse health effects occur frequency and a sizeable proportion of the population is highly annoyed and sleep disturbed'.
- 4.7.8 The table below therefore may be taken to represent the threshold for SOAEL:

Location	0700 - 2300	2300 - 0700
Living Room	63 dB(A) LAeq, 16 hr	-
Bedrooms	63 dB(A) LAeq, 8 hr	55 dB(A) LAeq, 8 hr

Table 4.6 – Proposed SOAEL Threshold Façade Noise Levels with Windows Open

5. PRIMARY RECOMMENDATIONS FOR FAÇADE DESIGN

5.1 Section 4.5.1 of this report has repeated the British Standard guidance for internal noise levels within residential properties, mirroring the advice in the Local Plan

5.2 It is therefore recommended that all residential units be designed to achieve the following levels:

Living Rooms/Bedrooms: ≤ 35 dB(A) L_{Aeq} , 07.00 – 23.00
Bedrooms: ≤ 30 dB(A) L_{Aeq} , 23.00 – 07.00, and
 ≤ 45 dB(A) L_{Amax} , 23.00 – 07.00⁴

5.3 Table 5.1 confirms the predicted overall external façade noise levels, dB(A), and overall performance targets for the facades of the building.

	Measured Façade Noise Levels			Target Reduction Across Facades	
Room Type	Living Rooms	Bedrooms		Living Rooms	Bedrooms
Elevation	L_{Aeq} , 16 hrs	L_{Aeq} , 8hrs	L_{Amax} , f	dB(A)	dB(A)
Front	61	62	76	26	32
Rear	59	52	72	24	27

Table 5.1 – Predicted Façade Noise Levels. dB(A)

5.4 As a minimum, therefore, the construction of the building should adopt the following specifications:

Element	Rooms	Specification
External walls	All	As existing, solid or cavity masonry
Glazing & Trickle Ventilation	Living Rooms, front Studio, rear	27 dB $R_w + C_{tr}$, implying a 4 / 16 / 4 configuration. Trickle vents (if any) to be rated at 35 dB $D_{n,e,w}$, in the open position.
	Bedrooms, front	32 dB $R_w + C_{tr}$, implying a 4 / 10 / 10 configuration. Trickle vents (if any) to be rated at 40 dB $D_{n,e,w}$, in the open position.

Table 5.2 – Recommended Specifications

5.5 The specification above would control day time noise levels in the rear facing flat, based on an external noise level of 59 dB(A). However, it is recognised that there are periods when noise levels lift to 65 dB(A) for a sustained period or 2 – 3 hours, due to the adjacent kitchen extract fan.

⁴ Excepting no more than 10 events per night.

- 5.6 Section 7 of this report will discuss means of eliminating this uplift but, pending any successful remediation, it is recommended that the rear façade is upgraded to allow for the periods of high noise.
- 5.7 Glazing for the rear Studio flat should therefore rated at 32 dB Rw + Ctr, implying a 4 / 10 / 10 configuration, and trickle ventilators should achieve 40 dB Dn,e,w in the open position.
- 5.8 Appendix 1 provides calculations to substantiate all of the above recommendations.

6. DESIGN FOR VENTILATION

- 6.1 The preferred means of countering overheating issues is usually to rely on open windows to provide the necessary ventilation.
- 6.2 Open windows do have an adverse impact on the acoustic integrity of the building construction, and there are various guidelines which inform the acceptable levels of internal noise during such means of ventilation.
- 6.3 Whilst Approved Document O, Overheating, does not apply to conversions such as this, the AVOG guide (see Section 4.7) offers the following range for external noise limits:

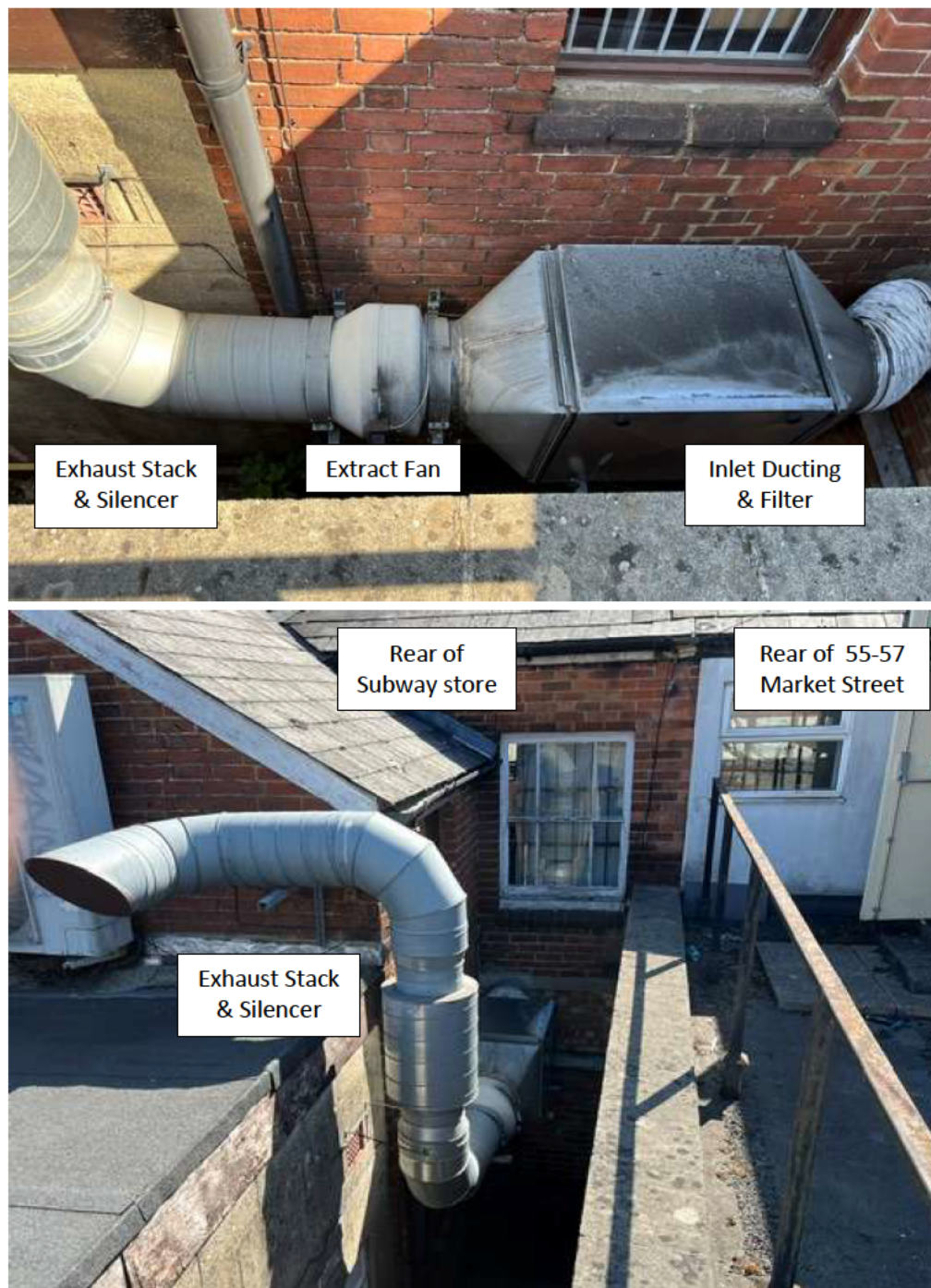
Location	0700 - 2300	2300 - 0700
Living Room	53 - 63 dB(A) LAeq, 16 hr	-
Bedrooms	53 - 63 dB(A) LAeq, 16 hr	48 - 53 dB(A) LAeq, 16 hr

Table 6.1 – Façade Noise Levels with Windows Open

- 6.4 In each case, the lower figure represents the standard below which there should be nominal adverse impact if windows are open. The upper figure represents the standard above which significant adverse effects would be expected. Unless there are exceptional reasons, it would be normal to apply the more onerous standard.
- 6.5 Comparing these thresholds (53 dB(A) during the day, and 48 dB(A) at night) against the site survey data summarised in Table 5.1, it can be seen that opening windows for ventilation purposes could give rise to adverse impacts internally.
- 6.6 Remediation, whilst not mandatory, is therefore recommended. This could be in the form of a whole building ventilation system for each flat (MVHR or Centralised Mechanical Extract) or, individual supply fans for each room. Here, a Nuaire Flatmaster PIV unit may represent a possible solution.
- 6.7 Whichever solution is adopted, it is recommended that the Acoustician reviews the proposal and advises whether attenuation is required both to control fan noise to an acceptable level, and to prevent external noise passing into the room through the system. This detailed design point could be conditioned by the Planning department, with information being submitted for approval prior to occupation.

7. ASSESSMENT OF KITCHEN EXTRACT FAN NOISE

- 7.1 Section 5 has provided a means by which the local environmental noise could be attenuated to ensure acceptable noise levels internally.
- 7.2 The most significant source, by an order of magnitude, is the kitchen extract fan associated with the adjacent Subway retail unit. The fan is located at the rear of the shop, in a small recess between the two buildings. It comprises an inline cylindrical extract fan, ducted through a silencer to exhaust on the roof of the adjacent building.



- 7.3 The noise emanates from the fan and ducting, rather than from the silenced exhaust.
- 7.4 It would in theory be quite simple to attenuate the fan, to the degree where it contributed no more than other local building services plant. Obviously, this requires work to a third party's equipment and would involve the necessary legal agreements.
- 7.5 The solution would be to apply an acoustic lagging around the external ductwork and fan casing, from the penetration out of the building up to the exhaust silencer. The specification of the lagging would be a 30mm mineral fibre quilt bonded to a 10 kg/m² sound barrier material (min. performance R_w 25 dB).
- 7.6 Anti-vibration mounts should be fitted between the fan and the supporting brackets, to prevent vibration into the building (nom. 30mm high rubber turret mounts, e.g. VT mounts by Eurovib).
- 7.7 Finally, an acoustic screen should be installed horizontally spanning the recess over the top of the fan and ducting. This would comprise a 50mm thick acoustic panels supported by angle iron framework on the masonry either side.
- 7.8 The combined works would reduce noise levels outside the new flats by some 15 dB(A).

8. INTERNAL SOUND INSULATION

- 8.1 With the creation of a new dwelling surrounding by commercial uses, it is also necessary to ensure that the party walls and floors to the flats will protect sufficiently against adjacent commercial activity.
- 8.2 In respect of the party walls either side of the development, the wall on the south side of the building is understood to be a separated wall. On the north side, adjacent to offices above Subway store, it is recommended that the existing construction be confirmed, with the following remediation being applied as relevant:
- (i) For a 300mm wide cavity masonry construction, or a 215mm thick solid concrete block construction, no remediation is necessary
 - (ii) For less constructions, apply an independent studwork frame to the wall, with 10mm clearance and no fixings back to the wall. Fill the frame with lightweight insulation quilt, and face with 2 x 12.5mm Wallboard plasterboard.
- 8.3 The treatment described in (ii) above would increase the performance to a level 5 – 10 dB better than the Building Regulation requirements, which should be quite sufficient for adjacent daytime office use.
- 8.4 In respect of the internal floor, separating retail from residential, the exact construction of the existing floor is not known, though it is believed to be a timber joisted construction.
- 8.5 To investigate further, a series of standard sound insulation tests were conducted on site. The survey was conducted between pairs of rooms, following the requirements set out in BS EN ISO 140 1998, part 4, "Measurement of sound insulation in building and of building elements - field measurements of airborne sound insulation between rooms.
- 8.6 For the airborne sound insulation tests, two loudspeakers were set up, facing into the corners of the retail space. A separate pink noise signal was then played through each PA. Attended source and receiver room measurements were taken using six static microphone positions; measured over 6 seconds (as defined in ISO 140:4 Section 6.3).
- 8.7 Measurements of the Reverberation Time in each receiving room were made using the impulse method. Also, background noise levels were recorded in each receiving room under the same conditions as the received, to ensure that the measured levels from the loudspeakers were sufficiently above extraneous noise sources, such as traffic. Where necessary, an adjustment was made to account for high background levels, as prescribed in the Standards.
- 8.8 Data was subsequently analysed using bespoke software, which meets the requirements of BS EN ISO 140 and 717, and Annex B of ADE.

- 8.9 Appendix 2 provides results from the tests, and Table 8.1 summarises the overall measured values of airborne sound insulation:

Source room (Ground)	Receive room (First	DnT,w+ Ctr
Shop Unit	Front Office (South)	33
Shop Unit	Front-to-back Office (front)	36
Shop Unit	Front-to-back Office (rear)	32
Shop Unit	Kitchenette	34

Table 8.1 – Existing Sound Insulation Performance, dB

- 8.10 The current edition of Approved Document E of the Building Regulations would seek a minimum separation of 43 dB DnT,w + Ctr between a residential property and adjacent use.
- 8.11 it is evident that the existing floor falls well below this standard, and some remediation would be required.
- 8.12 Where adjacent use is itself not of a typical residential style, however, additional protection may be appropriate.
- 8.11 The Use class for the unit, Class E – Commercial, Business or Service, covers a wide range of possible activities – including shops, offices, cafes, gyms, health care, creches et all. Each would be associated with a varying level of expected internal noise.
- 8.12 For offices and shops, it might be sufficient to protect residents over with a floor structure offering a performance equal to, or 5 dB above the Building Regulations minima. For gymnasiums, child-related provision or uses involving amplified music, a performance of 10 – 15 dB above Building Regulations may be appropriate.
- 8.13 In theory, a 5 dB exceedance of the standards could be achieved with the following build-up:

22mm chipboard flooring, spot bonded to 19mm plasterboard Plank
6mm Isorubber resilient layer
22mm decking fixed to the joists
Min 200mm timber joists, with 100mm semi-rigid slabs between
16mm Resilient Bar to underside of the joists
2 x 15mm SoundBloc plasterboard to the Resilient Bar

- 8.14 For a 10 – 15 dB exceedance of the standards, a more substantial system would be required:

22mm chipboard flooring, spot bonded to 19mm plasterboard Plank
Nom. 50mm deep Acoustic Cradle & Batten flooring system
22mm decking fixed to the joists
Min 200mm timber joists, with 100mm semi-rigid slabs between
British Gypsum MF ceiling grid, fixed using GAH/1 acoustic hanger, with grid set at
least 150mm below the joists.
3 x 15mm SoundBloc plasterboard to the MF Grid

Additionally, flanking walls to north and south sides of the retail to be lined with an
insulated BG Gypliner system

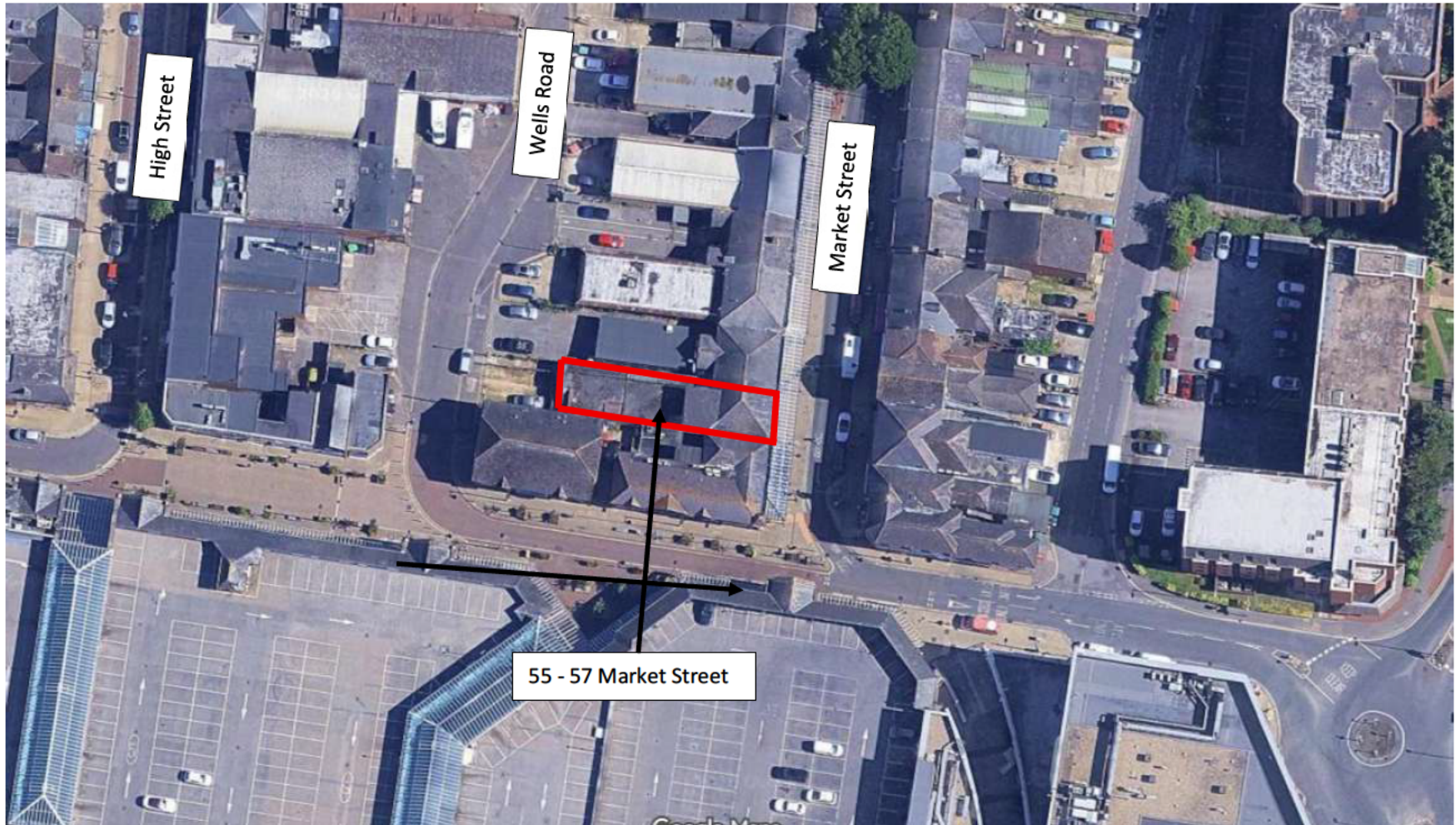
- 8.15 The Landlord should consider the intended use of the ground floor space, and adopt an
appropriate internal floor design.

- 8.16 Alternatively, they can provide a Building regulation compliant floor structure, and then advise
tenants that their fit out works must be sufficient to prevent noise levels reaching the flats
above exceeding the following noise levels:

Living Rooms and Bedrooms, 0700 – 2300	30 dB(A) LAeq, 15 mins
Bedrooms, 2300 – 0700 (of relevant)	25 dB(A) LAeq, 15 mins

- 8.17 It would also be appropriate to apply such limits to any new building services plant which
might be installed.

FIGURE 1 – SITE LOCATION PLAN



Existing Plan:



Proposed First Floor Plan
Scale: 1:200

The plan shows a rectangular building layout with the following rooms and dimensions:

- Reception**: 1.5m x 1.5m
- Kitchen**: 1.5m x 1.5m
- Dining**: 1.5m x 1.5m
- Living**: 1.5m x 1.5m
- Bedroom 1**: 1.5m x 1.5m
- Bedroom 2**: 1.5m x 1.5m
- Bedroom 3**: 1.5m x 1.5m
- Bedroom 4**: 1.5m x 1.5m
- Bedroom 5**: 1.5m x 1.5m
- Bedroom 6**: 1.5m x 1.5m
- Bedroom 7**: 1.5m x 1.5m
- Bedroom 8**: 1.5m x 1.5m
- Bedroom 9**: 1.5m x 1.5m
- Bedroom 10**: 1.5m x 1.5m
- Bedroom 11**: 1.5m x 1.5m
- Bedroom 12**: 1.5m x 1.5m
- Bedroom 13**: 1.5m x 1.5m
- Bedroom 14**: 1.5m x 1.5m
- Bedroom 15**: 1.5m x 1.5m
- Bedroom 16**: 1.5m x 1.5m
- Bedroom 17**: 1.5m x 1.5m
- Bedroom 18**: 1.5m x 1.5m
- Bedroom 19**: 1.5m x 1.5m
- Bedroom 20**: 1.5m x 1.5m
- Bedroom 21**: 1.5m x 1.5m
- Bedroom 22**: 1.5m x 1.5m
- Bedroom 23**: 1.5m x 1.5m
- Bedroom 24**: 1.5m x 1.5m
- Bedroom 25**: 1.5m x 1.5m
- Bedroom 26**: 1.5m x 1.5m
- Bedroom 27**: 1.5m x 1.5m
- Bedroom 28**: 1.5m x 1.5m
- Bedroom 29**: 1.5m x 1.5m
- Bedroom 30**: 1.5m x 1.5m
- Bedroom 31**: 1.5m x 1.5m
- Bedroom 32**: 1.5m x 1.5m
- Bedroom 33**: 1.5m x 1.5m
- Bedroom 34**: 1.5m x 1.5m
- Bedroom 35**: 1.5m x 1.5m
- Bedroom 36**: 1.5m x 1.5m
- Bedroom 37**: 1.5m x 1.5m
- Bedroom 38**: 1.5m x 1.5m
- Bedroom 39**: 1.5m x 1.5m
- Bedroom 40**: 1.5m x 1.5m
- Bedroom 41**: 1.5m x 1.5m
- Bedroom 42**: 1.5m x 1.5m
- Bedroom 43**: 1.5m x 1.5m
- Bedroom 44**: 1.5m x 1.5m
- Bedroom 45**: 1.5m x 1.5m
- Bedroom 46**: 1.5m x 1.5m
- Bedroom 47**: 1.5m x 1.5m
- Bedroom 48**: 1.5m x 1.5m
- Bedroom 49**: 1.5m x 1.5m
- Bedroom 50**: 1.5m x 1.5m
- Bedroom 51**: 1.5m x 1.5m
- Bedroom 52**: 1.5m x 1.5m
- Bedroom 53**: 1.5m x 1.5m
- Bedroom 54**: 1.5m x 1.5m
- Bedroom 55**: 1.5m x 1.5m
- Bedroom 56**: 1.5m x 1.5m
- Bedroom 57**: 1.5m x 1.5m
- Bedroom 58**: 1.5m x 1.5m
- Bedroom 59**: 1.5m x 1.5m
- Bedroom 60**: 1.5m x 1.5m
- Bedroom 61**: 1.5m x 1.5m
- Bedroom 62**: 1.5m x 1.5m
- Bedroom 63**: 1.5m x 1.5m
- Bedroom 64**: 1.5m x 1.5m
- Bedroom 65**: 1.5m x 1.5m
- Bedroom 66**: 1.5m x 1.5m
- Bedroom 67**: 1.5m x 1.5m
- Bedroom 68**: 1.5m x 1.5m
- Bedroom 69**: 1.5m x 1.5m
- Bedroom 70**: 1.5m x 1.5m
- Bedroom 71**: 1.5m x 1.5m
- Bedroom 72**: 1.5m x 1.5m
- Bedroom 73**: 1.5m x 1.5m
- Bedroom 74**: 1.5m x 1.5m
- Bedroom 75**: 1.5m x 1.5m
- Bedroom 76**: 1.5m x 1.5m
- Bedroom 77**: 1.5m x 1.5m
- Bedroom 78**: 1.5m x 1.5m
- Bedroom 79**: 1.5m x 1.5m
- Bedroom 80**: 1.5m x 1.5m
- Bedroom 81**: 1.5m x 1.5m
- Bedroom 82**: 1.5m x 1.5m
- Bedroom 83**: 1.5m x 1.5m
- Bedroom 84**: 1.5m x 1.5m
- Bedroom 85**: 1.5m x 1.5m
- Bedroom 86**: 1.5m x 1.5m
- Bedroom 87**: 1.5m x 1.5m
- Bedroom 88**: 1.5m x 1.5m
- Bedroom 89**: 1.5m x 1.5m
- Bedroom 90**: 1.5m x 1.5m
- Bedroom 91**: 1.5m x 1.5m
- Bedroom 92**: 1.5m x 1.5m
- Bedroom 93**: 1.5m x 1.5m
- Bedroom 94**: 1.5m x 1.5m
- Bedroom 95**: 1.5m x 1.5m
- Bedroom 96**: 1.5m x 1.5m
- Bedroom 97**: 1.5m x 1.5m
- Bedroom 98**: 1.5m x 1.5m
- Bedroom 99**: 1.5m x 1.5m
- Bedroom 100**: 1.5m x 1.5m

Other labels include: DETACHED WALL, OFFICE ABOVE COMMERCIAL UNIT, and a north arrow.

STUDIO FLAT 33m²

- LIVING / SLEEPING: 5.3m x 3.7m
- KITCHEN: 3.7m x 2.7m
- SHOWER ROOM: 2.7m x 2.7m
- STORAGE CUPBOARD

1-BED ROOM FLAT 44m²

- LIVING / SLEEPING: 5.3m x 3.7m
- KITCHEN: 3.7m x 2.7m
- SHOWER ROOM: 2.7m x 2.7m
- BEDROOM: 3.3m x 1.7m

1-BED ROOM 44m²

- LIVING / SLEEPING: 5.3m x 3.7m
- KITCHEN: 3.7m x 2.7m
- SHOWER ROOM: 2.7m x 2.7m
- BEDROOM: 3.3m x 1.7m

DETAILED WALL

FIGURE 3 – MEASURED NOISE LEVELS, MARKET ST ELEVATION 1

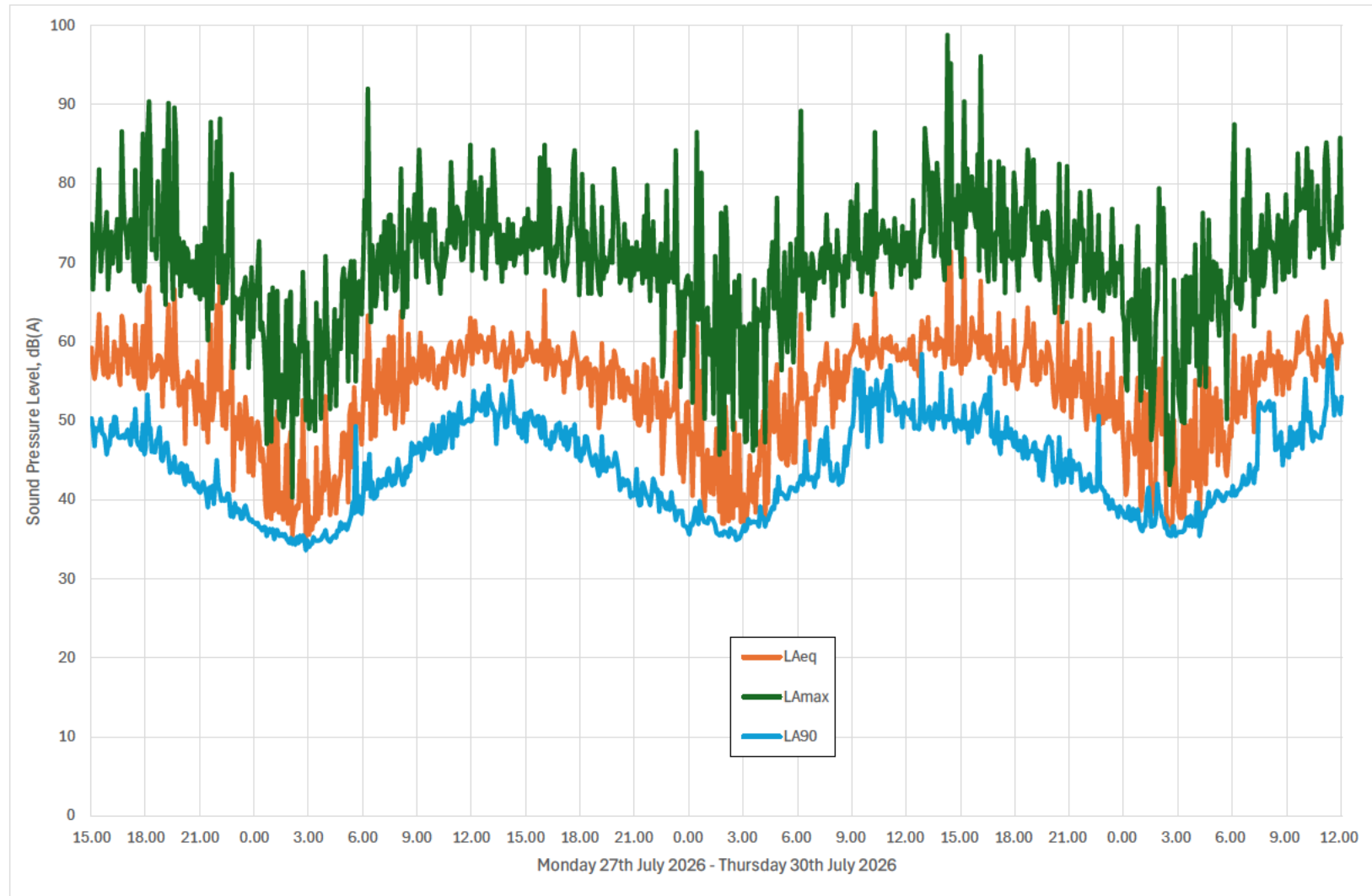


FIGURE 4 – MEASURED NOISE LEVELS, MARKET ST ELEVATION 2

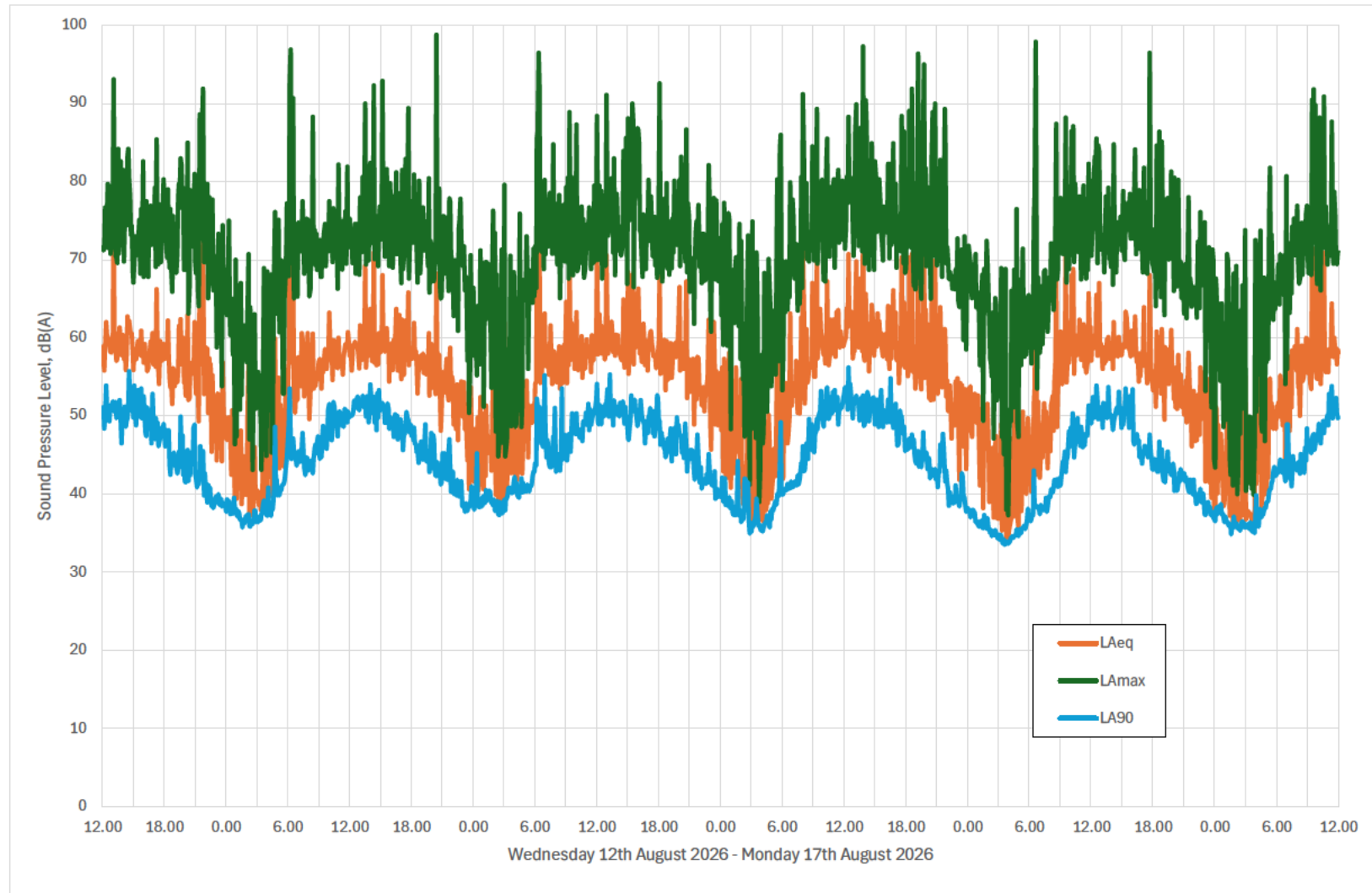


FIGURE 5 – MEASURED NOISE LEVELS, WELLS ROAD ELEVATION 1

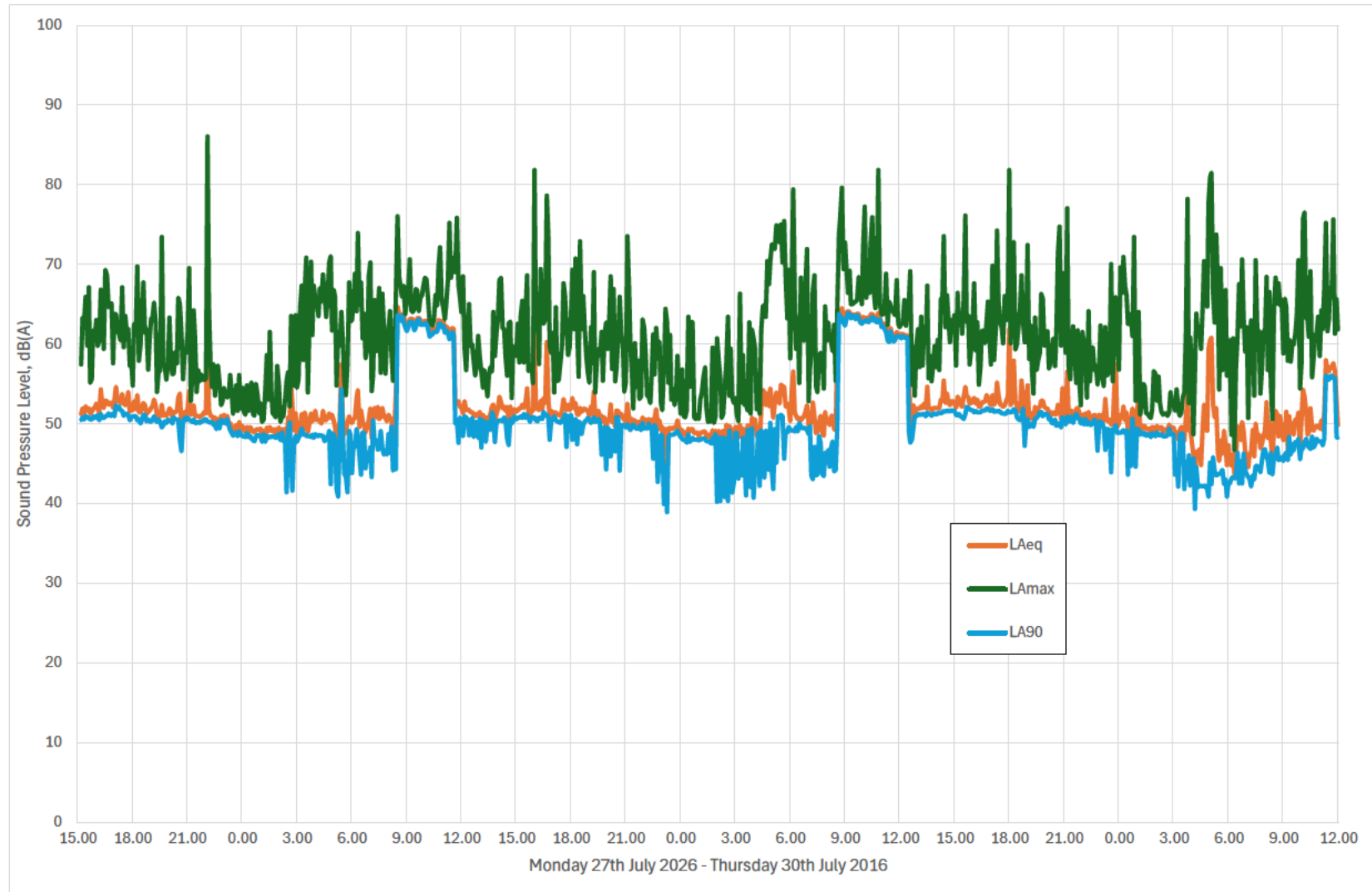
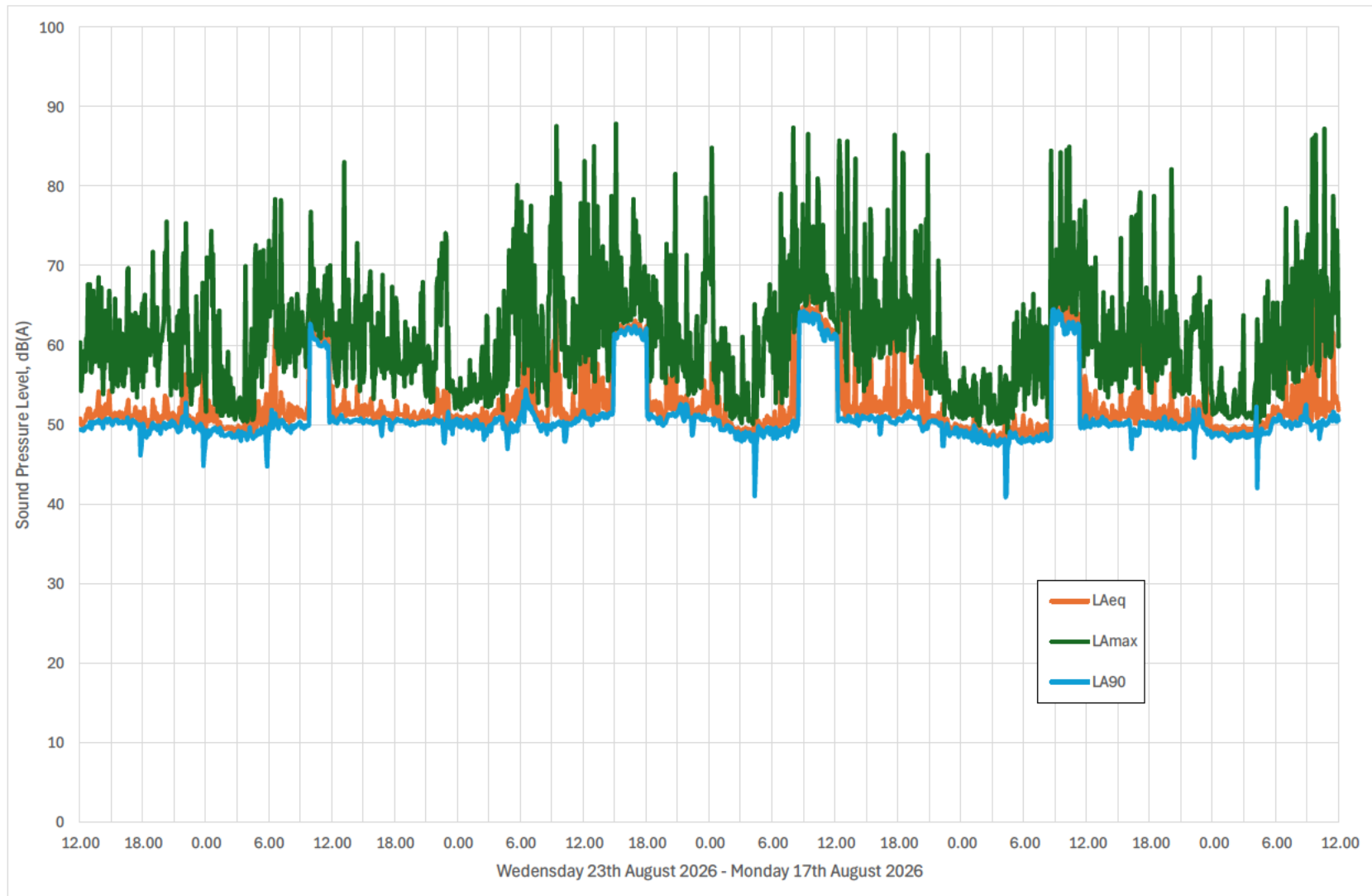


FIGURE 6 – MEASURED NOISE LEVELS, WELLS ROAD ELEVATION 2



APPENDIX 1 – CALCULATIONS OF NOISE BREAK-IN

Calculations for Front Elevation:

Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
Day Time LAeq	dB	72	73	63	54	51	49	43	33	61
SRI 27 dB Rw + Ctr glazing	dB	-21	-21	-18	-26	-37	-42	-33	-35	
Area Correction (3m2)	dB	3	3	3	3	3	3	3	3	
Room Correction (40m3, 0.5s)	dB	-11	-11	-11	-11	-11	-11	-11	-11	
Net SPL inside	dB	43	44	37	20	6	-1	2	-10	31
Trickle Ventilators, 35 dB Dn,e,w	dB	-34	-37	-39	-37	-36	-37	-39	-40	
10logN (number of vents=1)	dB	0	0	0	0	0	0	0	0	
Likely RT in Room	sec	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Room Volume	m3	40	40	40	40	40	40	40	40	
Absorption	m2	13	13	13	13	13	13	13	13	
Absorption Correction	dB	-1	-1	-1	-1	-1	-1	-1	-1	
Net SPL inside via vent	dB	37	35	23	16	14	11	3	-8	22
Cumulative Noise in Living Room	dB	44	44	37	21	15	11	5	-6	32
Night Time Leq	dB	63	62	60	55	55	54	52	48	61
Night Time Lmax	dB	85	76	74	73	71	69	65	61	76
SRI 32 dB Rw + Ctr glazing	dB	-25	-32	-22	-31	-38	-45	-46	-49	
Area Correction (2m2)	dB	3	3	3	3	3	3	3	3	
Room Correction (20m3, 0.5s)	dB	-8	-8	-8	-8	-8	-8	-8	-8	
Net SPL inside, Leq	dB	33	25	33	19	12	4	1	-6	25
Net SPL inside, Lmax	dB	55	39	47	37	28	19	14	7	40
Trickle Ventilators, 40 dB Dn,e,w	dB	-40	-41	-42	-37	-43	-46	-40	-40	
10logN (number of vents=1)	dB	0	0	0	0	0	0	0	0	
Likely RT in Room	sec	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Room Volume	m3	20	20	20	20	20	20	20	20	
Absorption	m2	6	6	6	6	6	6	6	6	
Absorption Correction	dB	2	2	2	2	2	2	2	2	
Net SPL inside via vent, Leq	dB	25	23	20	20	14	10	14	10	22
Net SPL inside via vent, Lmax	dB	47	37	34	38	30	25	27	23	38
Cumulative Noise in Bedroom, Leq	dB	34	27	33	22	16	11	14	10	27
Cumulative Noise in Bedroom, Lmax	dB	56	41	47	40	32	26	27	23	42

Calculations for Rear Elevation:

Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
Day Time LAeq	dB	61	65	60	58	52	49	44	30	59
Night Time Leq	dB	57	55	52	51	46	41	36	25	52
Night Time Lmax	dB	75	68	66	64	65	68	60	40	72
SRI 27 dB Rw + Ctr glazing	dB	-21	-21	-18	-26	-37	-42	-33	-35	
Area Correction (2m2)	dB	3	3	3	3	3	3	3	3	
Room Correction (50m3, 0.5s)	dB	-12	-12	-12	-12	-12	-12	-12	-12	
Net SPL inside, Leq daytime	dB	31	35	33	23	6	-2	2	-14	26
Net SPL inside, Leq night time	dB	27	25	25	16	0	-10	-6	-19	18
Net Lmax inside, night	dB	45	38	39	29	19	17	18	-4	33
Trickle Ventilators, 35 dB Dn,e,w	dB	-34	-37	-39	-37	-36	-37	-39	-40	
10logN (number of vents=1)	dB	0	0	0	0	0	0	0	0	
Likely RT in Room	sec	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Room Volume	m3	50	50	50	50	50	50	50	50	
Absorption	m2	16	16	16	16	16	16	16	16	
Absorption Correction	dB	-2	-2	-2	-2	-2	-2	-2	-2	
Net SPL inside via vent, Leq daytime	dB	25	26	19	19	14	10	3	-12	20
Net SPL inside via vent, Leq night time	dB	21	16	11	12	8	2	-5	-17	13
Net SPL inside via vent, Lmax night	dB	39	29	25	25	27	29	19	-2	33
Cumulative Noise Day Time Leq	dB	32	35	33	24	15	10	5	-10	27
Cumulative Noise Night Time Leq	dB	28	25	25	17	9	2	-3	-15	19
Cumulative Noise Night Time Lmax	dB	46	38	39	30	28	29	21	0	36
Rear Elevation - Alternative Specification when Subway Fan Operates										
Frequency	Hz	63	125	250	500	1000	2000	4000	8000	dB(A)
Day Time LAeq, t	dB	62	71	64	59	58	57	49	35	64
SRI 32 dB Rw + Ctr glazing	dB	-25	-32	-22	-31	-38	-45	-46	-49	
Area Correction (2m2)	dB	3	3	3	3	3	3	3	3	
Room Correction (50m3, 0.5s)	dB	-12	-12	-12	-12	-12	-12	-12	-12	
Net SPL inside, Leq daytime	dB	28	30	33	19	11	3	-6	-23	25
Trickle Ventilators, 40 dB Dn,e,w	dB	-40	-41	-42	-37	-43	-46	-40	-40	
10logN (number of vents=1)	dB	0	0	0	0	0	0	0	0	
Likely RT in Room	sec	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Room Volume	m3	50	50	50	50	50	50	50	50	
Absorption	m2	16	16	16	16	16	16	16	16	
Absorption Correction	dB	-2	-2	-2	-2	-2	-2	-2	-2	
Net SPL inside via vent, Leq daytime	dB	20	28	20	20	13	9	7	-7	21
Cumulative Noise Day Time Leq	dB	29	32	33	22	15	10	7	-7	26

APPENDIX 2 – EXISTING SOUND INSULATION OF INTERNAL FLOOR

Standardized level difference according to ISO 140-4 Field measurements of airborne sound insulation between rooms			
Client:	BSZ Properties Limited	Date of test:	12/08/2026
Project:	55 - 57 Market Street, Eastleigh		
Object:	Floor between Shop Unit and Front Office (South)		
Construction:	Unknown, assume timber joisted		
Source room volume (m³):	400		
Receiving room volume (m³):	30		

Frequency f Hz	D _{nT} (1/3 octave) dB
50	
63	
80	
100	21.0
125	31.4
160	27.2
200	29.2
250	27.2
315	27.9
400	28.4
500	28.6
630	33.4
800	36.2
1000	37.1
1250	41.8
1600	40.6
2000	43.2
2500	46.3
3150	45.5
4000	
5000	

* limit of measurement (>=Value)

Rating according to ISO 717-1

D_{nT,w} (C;C_{tr}) = 36 (-1;-3)

Evaluation based on field measurement, results obtained by an engineering method

No. of test report: M6091/1	Name of test institute: Ian Sharland Ltd
Date: 17/08/2026	Signature: [Redacted Signature]

Standardized level difference according to ISO 140-4 Field measurements of airborne sound insulation between rooms

Client: BSZ Properties Limited

Date of test: 12/08/2026

Project: 55 - 57 Market Street, Eastleigh

Object: Floor between Shop Unit and Front-to-back Office (front)

Construction: Unknown, assume timber joisted

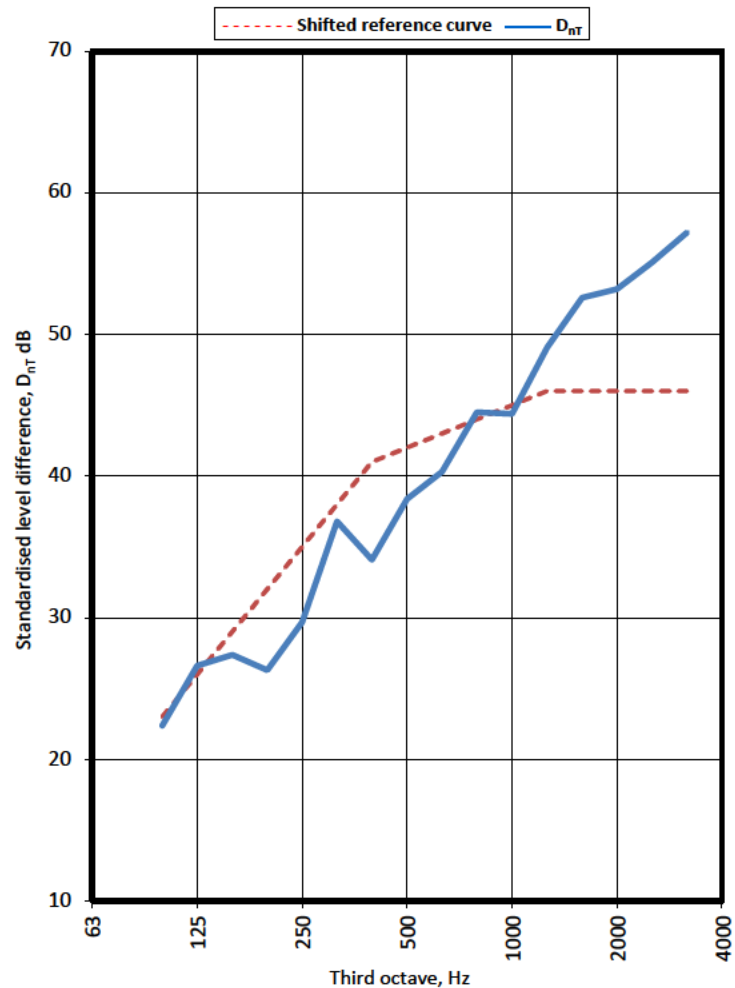
Source room volume (m³): 400

Receiving room volume (m³): 100

Frequency f Hz	D_{nT} (1/3 octave) dB
50	
63	
80	
100	22.4
125	26.6
160	27.4
200	26.3
250	29.7
315	36.8
400	34.1
500	38.4
630	40.3
800	44.5
1000	44.4
1250	49.1
1600	52.6
2000	53.2
2500	55.1
3150	57.2
4000	
5000	

*
*
*

* limit of measurement ($\geq$ Value)



Rating according to ISO 717-1

$D_{nT,w} (C; C_{tr}) = 42 (-2; -6)$

Evaluation based on field measurement, results obtained by an engineering method

No. of test report: M6091/2

Name of test institute: Ian Sharland Ltd

Date: 17/08/2026

Signature:

Standardized level difference according to ISO 140-4 Field measurements of airborne sound insulation between rooms

Client: BSZ Properties Limited

Date of test: 12/08/2026

Project: 55 - 57 Market Street, Eastleigh

Object: Floor between Shop Unit and Front-to-back Office (rear)

Construction: Unknown, assume timber joisted

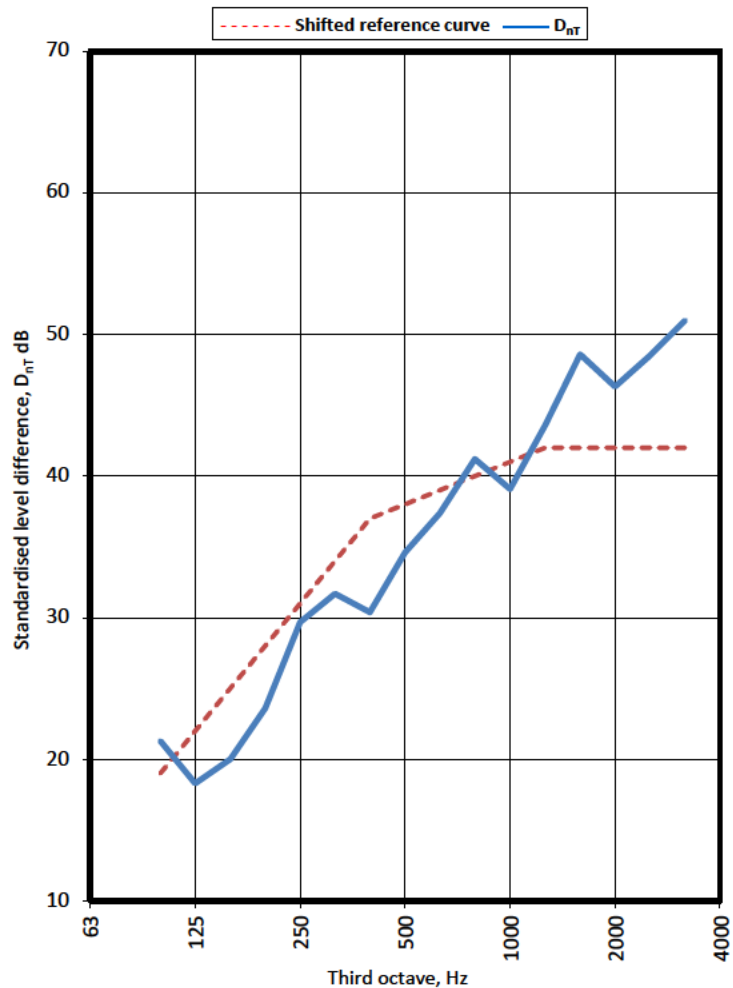
Source room volume (m³): 400

Receiving room volume (m³): 100

Frequency f Hz	D_{nT} (1/3 octave) dB
50	
63	
80	
100	21.3
125	18.3
160	20.0
200	23.6
250	29.7
315	31.7
400	30.4
500	34.6
630	37.4
800	41.2
1000	39.1
1250	43.6
1600	48.6
2000	46.3
2500	48.5
3150	51.0
4000	
5000	

*
*
*

* limit of measurement ($\geq$ Value)



Rating according to ISO 717-1

$D_{nT,w} (C; C_{tr}) = 38 (-2; -6)$

Evaluation based on field measurement, results obtained by an engineering method

No. of test report: M6091/3

Name of test institute: Ian Sharland Ltd

Date: 17/08/2026

Signature:

Standardized level difference according to ISO 140-4 Field measurements of airborne sound insulation between rooms

Client: BSZ Properties Limited

Date of test: 12/08/2026

Project: 55 - 57 Market Street, Eastleigh

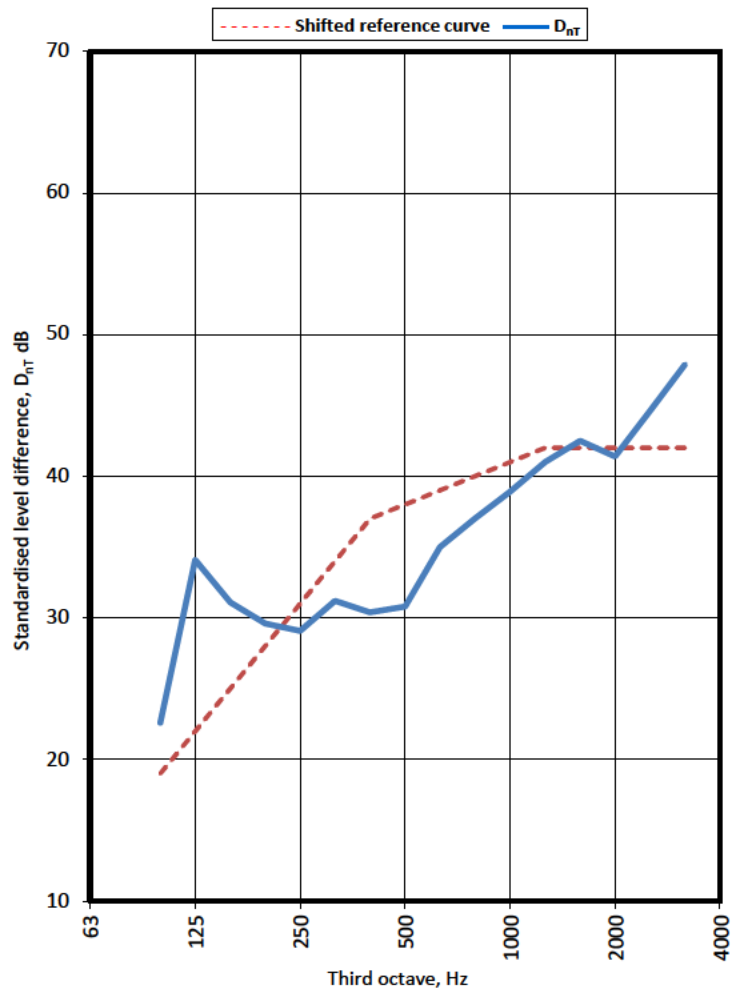
Object: Floor between Shop Unit and Kitchenette

Construction: Unknown, assume timber joisted

Source room volume (m³): 400

Receiving room volume (m³): 30

Frequency f Hz	D _{nT} (1/3 octave) dB
50	
63	
80	
100	22.6
125	34.1
160	31.1
200	29.6
250	29.1
315	31.2
400	30.4
500	30.8
630	35.0
800	37.0
1000	38.9
1250	41.0
1600	42.5
2000	41.4
2500	44.6
3150	47.9
4000	
5000	



* limit of measurement ($\geq$ Value)

Rating according to ISO 717-1

D_{nT,w} (C; C_{tr}) = 38 (-1; -4)

Evaluation based on field measurement, results obtained by an engineering method

No. of test report: M6091/4

Name of test institute:

Ian Sharland Ltd

Date: 17/08/2026

Signature:

APPENDIX 3 – TERMINOLOGY RELATING TO NOISE

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level	The sound level is the sound pressure relative to a standard reference pressure of 20µPa (20x10 ⁻⁶ Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log ₁₀ (s1 / s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20µPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A scale, which considers the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
Leq,T	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
Lmax,T	A noise level index defined as the maximum noise level during the period T. Lmax is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L90,T	A noise level index. The noise level exceeded for 90% of the time over the period T. L90 can be considered to be the "average minimum" noise level and is often used to describe the background noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m.
Façade Noise Level	At 1m in front of a large sound reflecting object such as a façade.
Fast/Slow Time Weighting	Averaging times used in sound level meters.
Octave Band	Range of frequencies whose upper limit is twice the lower limit.
Rw	Single number quantity that characterises the airborne sound insulating properties of a material or building element over a range of frequencies.