
INVESTMENT STREET LIMITED

NOISE IMPACT ASSESSMENT REPORT

OLD POST OFFICE, STATION ROAD, HINCKLEY

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Road, Milton Keynes
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1 INTRODUCTION

1.1 Overview

1.1.1 By instruction from Investment Street Ltd, 22 Towcester Road, Milton Keynes ('the client'), NoiseAir was commissioned to undertake a noise impact assessment (NIA) in support of a planning application. A planning application has been submitted proposing conversion of the Old Post Office Building, Station Road, Hinckley LE10 1AW to a 13-bedroom luxury HMO.

1.1.2 The planning reference is : 26/00045/FUL

1.1.3 Hinckley & Bosworth Borough Council have requested the following, in relation to noise:

"The applicant should have a Noise Impact Assessment carried out to inform a suitable level of mitigation from external noise and noise from the ground floor commercial unit. The NIA should cover both internal noise transfer and noise from external areas affecting occupiers. I recommend the following condition:

C40. Noise

- a) Development shall not begin until a scheme for protecting the proposed dwellings from noise from the commercial unit at ground floor and external noise has been submitted to and approved by the Local Planning Authority*
- b) All works which form part of the scheme shall be completed before any of the permitted dwellings are first occupied."*

1.1.4 A Noise Impact Assessment is therefore required in support of the application to determine the baseline noise environment at the site, consider acoustic impacts associated with the scheme, and identify mitigation measures where necessary.

1.1.5 General limitations with respect to this NIA are outlined in **Appendix A**.

1.2 Site Description

1.2.1 The site is in the centre of Hinckley. It was observed to be busy with the surrounding roads being in constant use. Other than traffic noise, the locality can be described as an urbanised centre.

1.2.2 **Figure 1** presents a site view of the development site with respect to the local area and its context.



Figure 1: Site in Context – Plan View.

1.3 Development Proposals

- 1.3.1 At the time of writing, proposals outline the re-development of the site to consist of eight studio apartments. The proposed floor plans are shown below in **Figure 2 - Figure 4**.

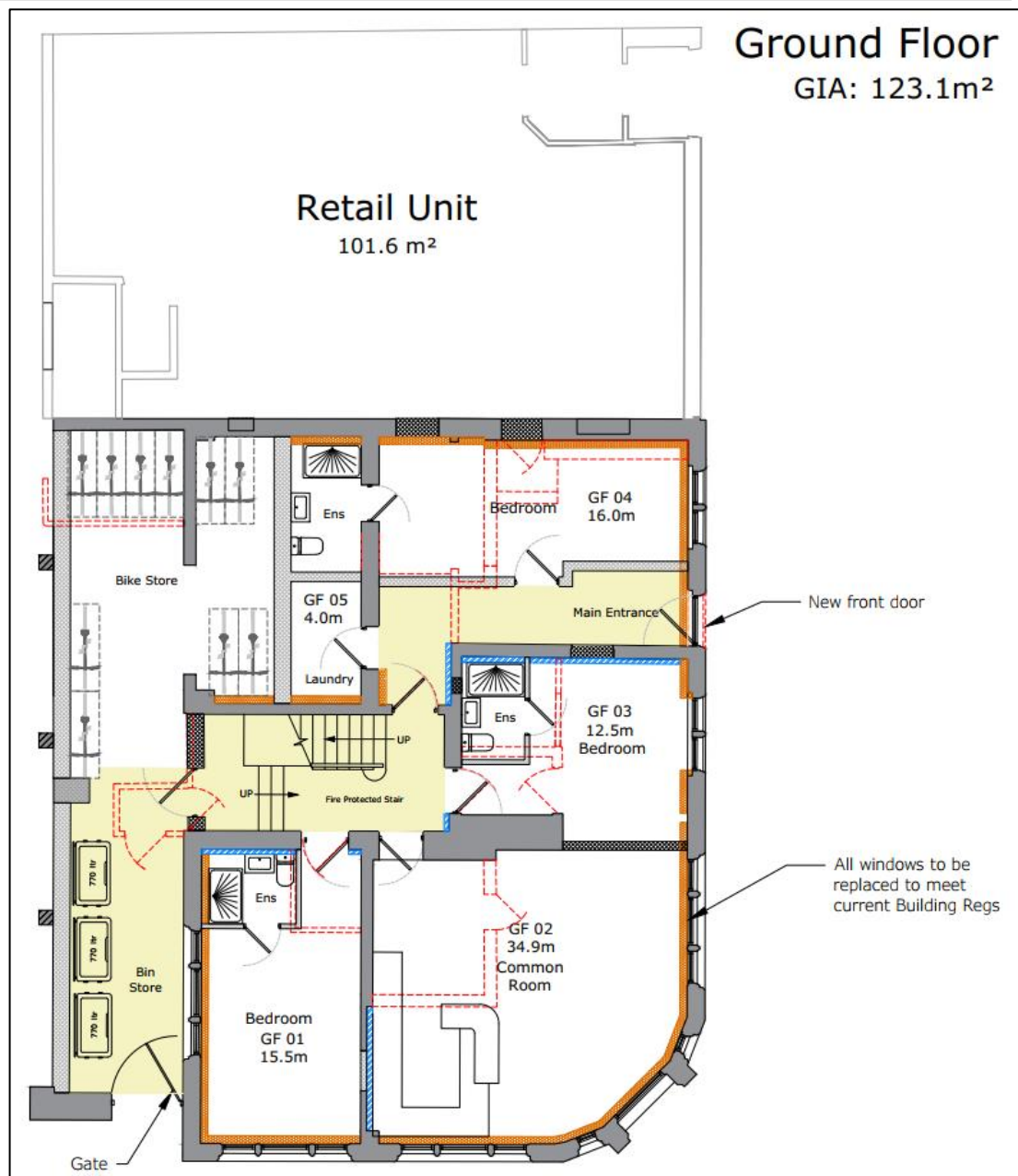


Figure 2: Proposed Ground Floor Layout - Plan View

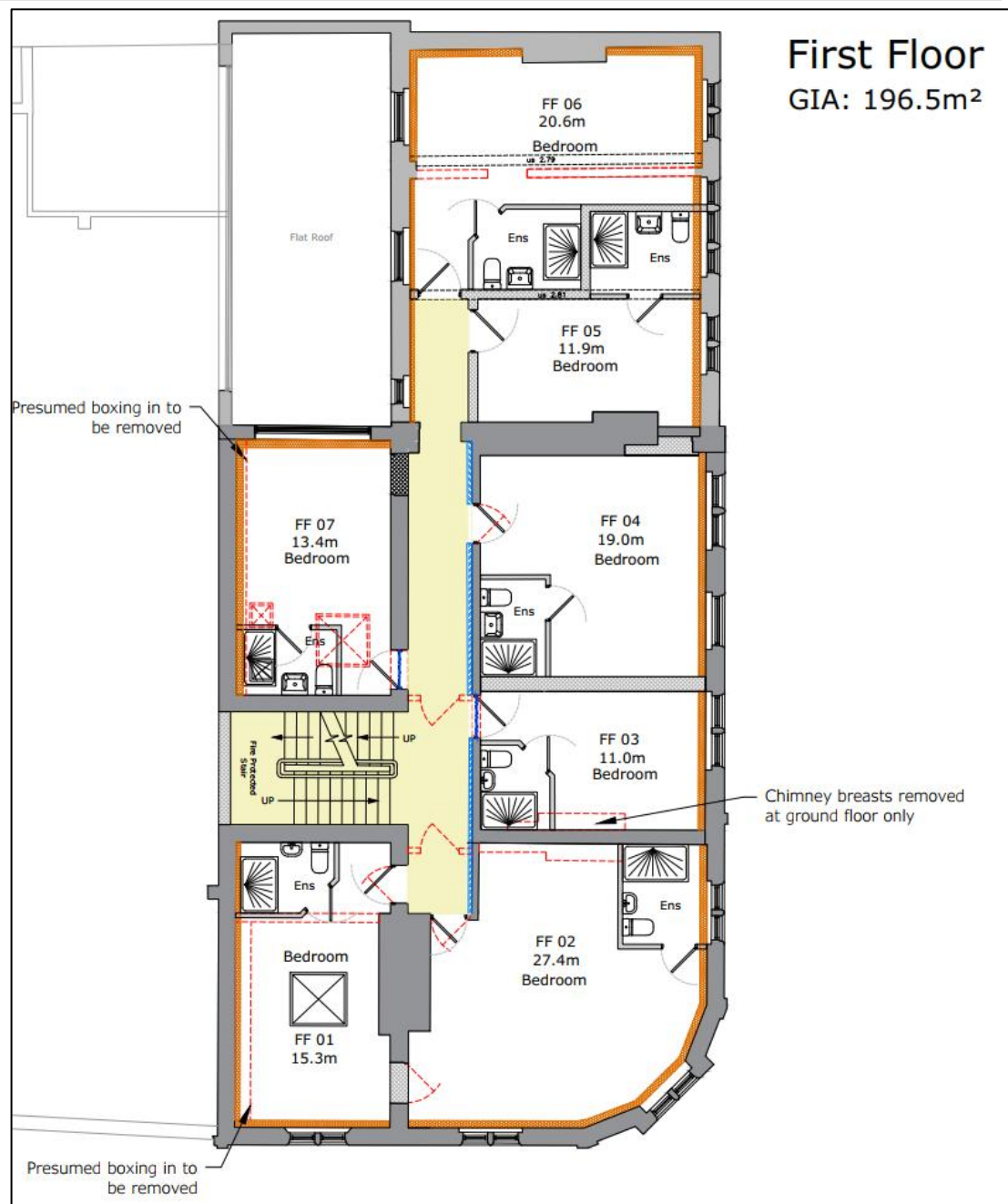


Figure 3: Proposed 1st Floor Layout - Plan View

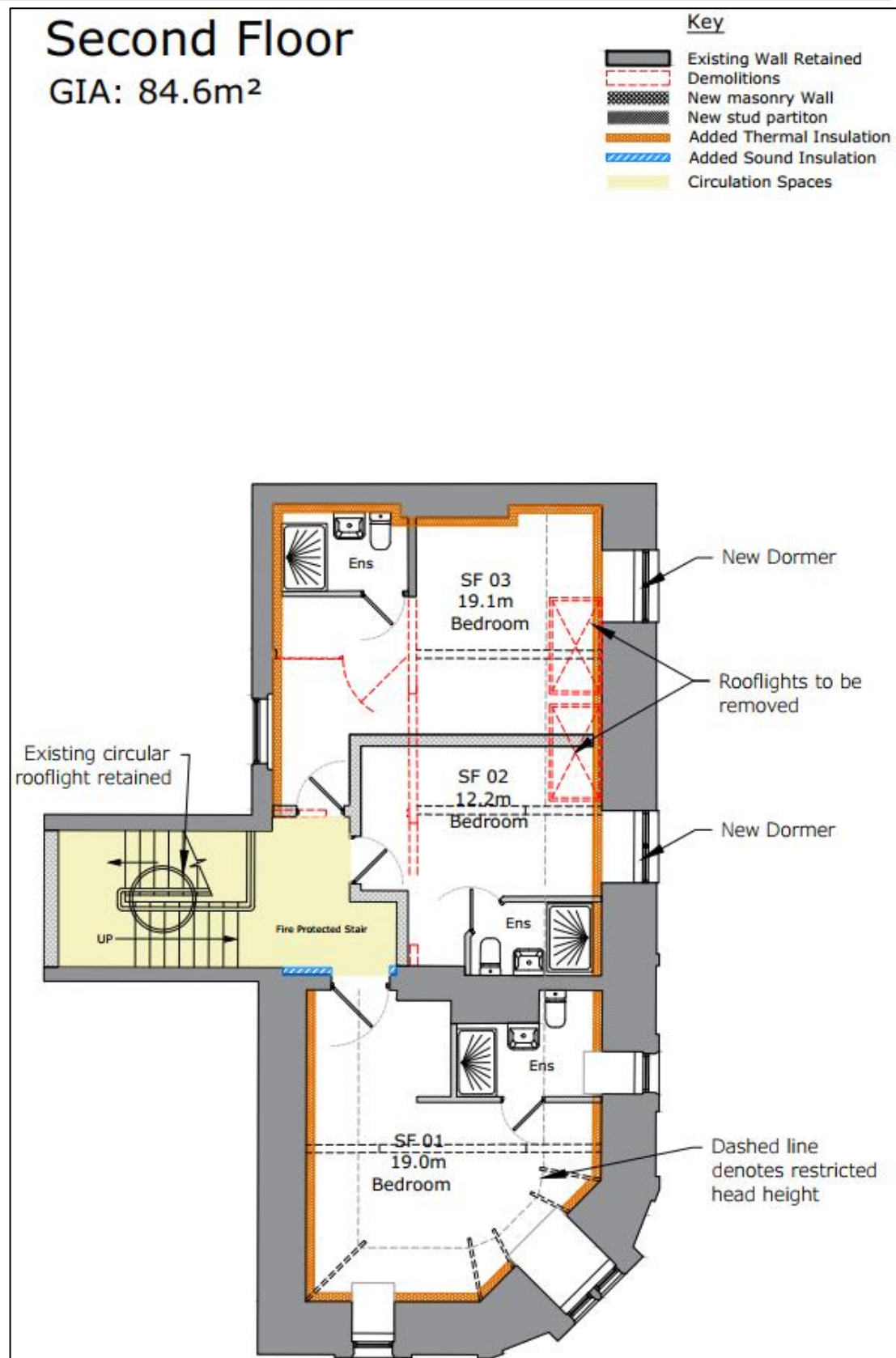


Figure 4: Proposed 2nd Floor Layout - Plan View

2 ASSESSMENT METHODOLOGY AND SCOPE OF WORKS

2.1 National Planning Policy Framework [NPPF 2024]

- 2.1.1 The NPPF sets out the government's planning policies for England and how they are expected to be applied. It aims to achieve sustainable development; stating that planning policies and decisions should prevent unacceptable levels of noise pollution from new and existing development while affirming that National Policy Statements form part of the national planning policy framework and should be considered in planning decisions.

2.2 Noise Policy Statement for England (NPSE)

- 2.2.1 The Noise Policy Statement for England (NPSE), published in March 2010, states the long-term vision of Government noise policy is to "promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development".
- 2.2.2 The NPSE sets out the government's overall policy on noise within the context of sustainable development. It introduces three concepts for noise management: avoid significant adverse effects; mitigate and minimise adverse effects; and where possible, contribute to improvements in health and quality of life.
- 2.2.3 It also establishes a hierarchy of noise management actions: avoid; reduce; remedy; mitigate; compensate.
- 2.2.4 The NPSE also introduces the below categories with respect to 'adverse impacts.'

'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.

SOAEL – Significant Observed Adverse Effect Level

- This is the level above which significant adverse effects on health and quality of life occur.'

- 2.2.5 The NPSE states that significant adverse effects on health and quality of life should be avoided. Where the impact lies somewhere between LOAEL and SOAEL, it requires that all reasonable steps are taken to mitigate and minimise the adverse effects of noise. In this regard, a certain degree of impact between LOAEL and SOAEL would be acceptable in terms of planning policy, provided that the impact has been mitigated and minimised by design.

2.3 Planning Practice Guidance - Noise [PPG 2019]

2.3.1 PPG 2019 provides guidance on how noise should be considered in planning decisions. It was published in 2014 and updated in 2019. The document advises on how to avoid, mitigate, or minimise adverse effects of noise through good acoustic design and appropriate conditions or obligations.

2.3.2 **Table 1** summarises the noise exposure hierarchy outlined within the PPG.

Table 1: National Planning Practice Guidance noise exposure hierarchy		
Perception	Increasing Effect Level	Action
Not noticeable	No Observed Effect	No specific measures required
Noticeable and not intrusive	No Observed Adverse Effect	No specific measures required
Lowest Observed Effect Level		
Noticeable and intrusive	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Effect Level		
Noticeable and disruptive	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Unacceptable Adverse Effect	Prevent

2.4 Pro-PG – Planning & Noise [Pro-PG 2017]

2.4.1 Pro-PG:2017 Planning and Noise provides professional practice guidance in relation to new residential development exposed to noise from transport sources. It provides practitioners with a recommended approach to the management of noise within the planning system in England.

2.4.2 The guidance reflects the Government’s overarching National Planning Policy Framework, the Noise Policy Statement for England, and Planning Practice Guidance (including PPG-Noise) and draws on other authoritative sources of guidance. It provides advice for Local Planning Authorities and developers, and their professional advisers, on achieving good acoustic design in and around new residential developments.

2.4.3 Pro-PG:2017 adopts a two-stage approach to assessment:

- **Stage 1** – an initial noise risk assessment of the proposed development site; and,
- **Stage 2** – a systematic consideration of four key elements.

2.4.4 The four key elements to be undertaken in parallel during Stage 2 of the recommended approach are:

- **Element 1** – demonstrating a “Good Acoustic Design Process”

- **Element 2** – observing internal “Noise Level Guidelines”
- **Element 3** – undertaking an “External Amenity Area Noise Assessment”
- **Element 4** – consideration of other relevant issues

2.4.5 Internal noise level guidelines are set out in Figure 2 of Pro-PG:2017 which have been reproduced in Table 2.

Table 2: Summary of internal noise guidelines.			
Activity	Location	0700 – 2300 hours	2300 – 0700 hours
Resting	Living Room	35 dB $L_{Aeq,18hour}$	-
Dining	Dining room / area	40 dB $L_{Aeq,18hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,18hour}$	30 dB $L_{Aeq,8hour}$ 45 dB L_{Amax}

2.4.6 There are multiple notes outlined within Pro-PG:2017 with respect to **Table 2** which should be considered in full however the main points for consideration are outlined below:

- The table provides recommended internal $L_{Aeq,T}$ target levels for overall noise in the design of a building. These are the sum total of structure-borne noise and airborne noise sources.
- The internal $L_{Aeq,T}$ target levels shown in the table are based on the existing guidelines issued by the World Health Organisation (WHO) and assume normal diurnal fluctuation in external noise.
- The internal $L_{Aeq,T}$ 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.
- Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. 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 45dB L_{AFmax} , 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.
- 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.

- 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.

2.4.7 The guidelines presented in Table 2 reflect and extend current practice contained in BS 8233:2014.

2.4.8 In terms of external amenity noise assessment, Pro-PG:2017 again draws upon guidelines set presented by the WHO and also presented in BS 8233:2014.

2.5 British Standard 8233:2014 (BS 8233)

2.5.1 British Standard 8233:2014 – *Guidance on sound insulation and noise reduction for buildings* (BS 8233) provides guidance on internal ambient noise levels, resulting from break-in of external environmental noise that should not be exceeded in various locations within dwellings.

2.5.2 Guidelines for buildings in terms of internal noise level are reported in **Table 3**.

Table 3: Summary of guidelines for internal ambient noise levels (IANL).			
Activity	Location	0700 – 2300 hours	2300 – 0700 hours
Resting	Living Room	35 dB $L_{Aeq,16hr}$	-
Dining	Dining room / area	40 dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$

2.5.3 The standard clarifies that these values are based on the existing guidelines issued by the World Health Organisation (WHO). In addition, it states that IANL's may be relaxed by up to 5 dB whilst maintaining a reasonable living condition.

2.5.4 BS 8233:2014 states that “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 $L_{Aeq,16hr}$ ”. The standard continues... “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 but should not be prohibited.”

2.6 British Standard 4142:2014 (BS 4142:2014)

2.6.1 British Standard 4142:2014 - *Methods for rating and assessing industrial and commercial sound*, sets the methodology for rating and assessing sound of an industrial and commercial nature, which includes sound from fixed installations such as mechanical and electrical plant and equipment.

- 2.6.2 In BS 4142:2014, a noise rating is determined and compared with the existing local background sound level based on several more cumulative acoustic feature corrections to apply where appropriate. For example, if the noise includes a distinguishable tone, impulse, intermittency or other readily distinguishable sound characteristic, then additional cumulative penalties individually ranging from 0 to 9 dB may be applied depending on the type of noise.
- 2.6.3 BS 4142:2014 seeks to determine a “representative” background sound level, stating that “...the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods”.
- 2.6.4 The assessment of the impact depends upon the margin by which the rating level of the specific sound source exceeds the background sound level but also promotes a consideration of the context in which the sound occurs when making an assessment. BS 4142:2014 states that an initial estimate of the impact of the specific sound is made by subtracting the measured background sound level from the rating level, while considering the following points:
- 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; and,
 - 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.
- 2.6.5 Therefore, a BS 4142:2014 assessment may deduce a low impact where the specific sound level is below the background sound level.

2.7 Scope of Works

- 2.7.1 The LPA has proposed a condition for this project (reference: 26/00045/FUL). Assessment criteria has been set but no actual numerical targets for noise have been used or specific standards to use. In this instance we will adopt the incumbent guidance that is relevant to projects of this type.

2.8 Assessment Criteria

- 2.8.1 There is potential for road and pedestrian noise to impact future residents at the proposed dwellings. The methodology of Pro-PG:2017, Planning and Noise will be used to assess the

impact of road traffic and pedestrian noise. Pro-PG 2017 is geared specifically for new-build developments, its methodology is deemed the most appropriate available. And references the internal ambient noise level (IANL) targets set out in BS 8233:2014.

- 2.8.2 The methodology of BS4142:2014 + A1 2019 will be used to assess both the impact of existing plant noise and set limits for the any future plant installations.
- 2.8.3 In response to the LPA comments that refer to protecting future residents from commercial noise (more specifically, the Party wall of bedroom GF 04, adjacent to retail unit), The criteria of BS8233:2014 will be used. For commercial noise, the internal ambient noise criteria will be 5 dB more onerous. This is to account for commercial noise that will likely have character and will therefore likely be more intrusive.

3 ACOUSTIC SURVEY

3.1 Noise Monitoring

3.1.1 NoiseAir conducted noise monitoring on 29th May to the 3rd June 2026 at the site.

Unattended noise monitoring was undertaken at one monitoring location, ML1, details of which are presented in **Figure 5** below and in **Table 4**.

Table 4: Sound level meter measurement location(s)			
Position	grid reference +/- 1 m (Google)	distance from façade (m)	façade correction applied (dB)
ML1	52.539696506626775, -1.3729172646640102	< 1m	No



Figure 5: Noise Monitoring Locations

3.1.2 Noise measurements were made using Class 1, integrating sound level meter(s) (SLM).

3.1.3 The acoustic equipment was calibrated to comply with Section 4.2 of BS 7445-1:2003¹, before and after the noise monitoring periods. The results are summarised in **Table 5**.

Table 5: Summary of SLMs used for survey and associated field calibration						
SLM (Serial No.)	Preamp (Serial No.)	Microphone (Serial No.)	Calibrator (Serial No.)	Start Calibration	End Calibration	Drift
Nor 140 (1403328)	NOR 1209 (12694)	NOR 1225 (72914)	B&K 4231 (2431761)	-26.6	-26.4	0.2

¹ BS 7445-2003 "Description and measurement of environmental noise – Part 1: Guide to quantities and procedures.

3.1.4 Weather conditions were taken from an online data source. There were some short isolated instances of light rain, the temperature remained above 5 degrees and wind speeds were less than 5 m/s. In the main, the weather is considered favourable.

3.2 Measured Sound Levels – ML1

3.2.1 **Figure 6** details a level vs time graph of the recorded L_{AFmax} , L_{Aeq} and L_{A90} sound levels, over 15-minute time periods for the entire survey. All measurements taken at ML1 are free field.

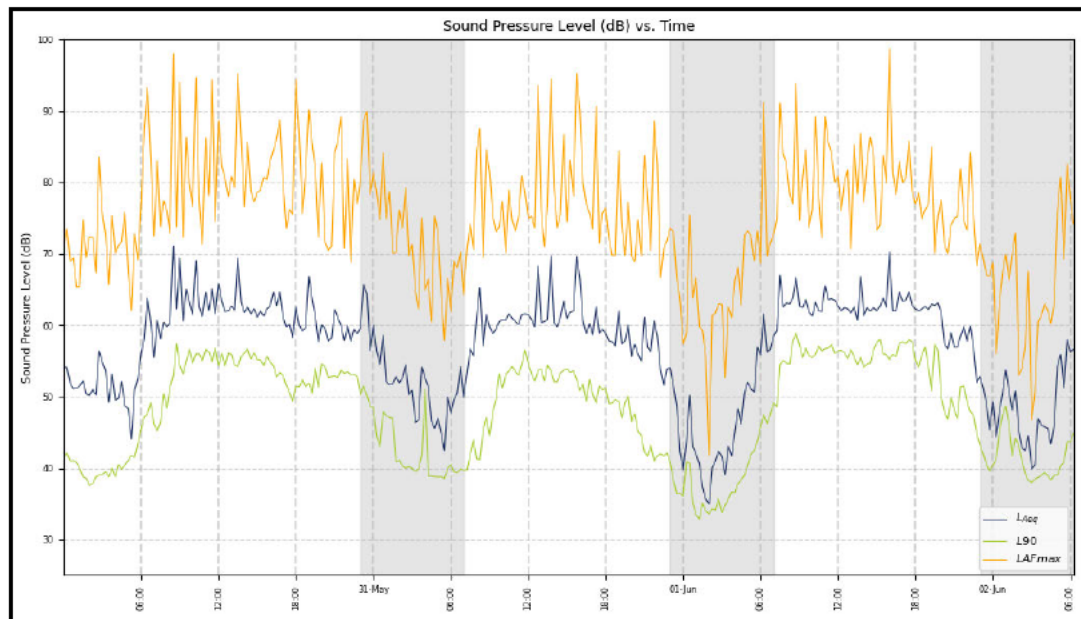


Figure 6: Level vs. time graph showing L_{Amax} , L_{Aeq} and L_{A90} sound levels – ML1

3.2.2 Results from ML1 and ML2 are presented below.

Table 6: Measured Noise Levels (free-field) -ML1									
Period	dBA	Octave Band (Hz) Levels (dB)							
		63	125	250	500	1K	2K	4K	8K
Daytime, 07:00-23:00 ($L_{Aeq,T}$)	63	70	68	66	57	58	54	49	46
Nighttime, 23:00-07:00 ($L_{Aeq,T}$)	56	63	66	58	52	51	46	38	33
Nighttime Max, 23:00-07:00 ($L_{AFMax,t}$)*	78	70	63	62	65	71	76	66	48

* The values for the $L_{AFMax,t}$ metric are that which was not normally exceeded more than 10 times in a given nighttime period (23:00-07:00).

3.3 Background sound levels – ML1

3.3.1 Measured background levels at ML1 are presented below.

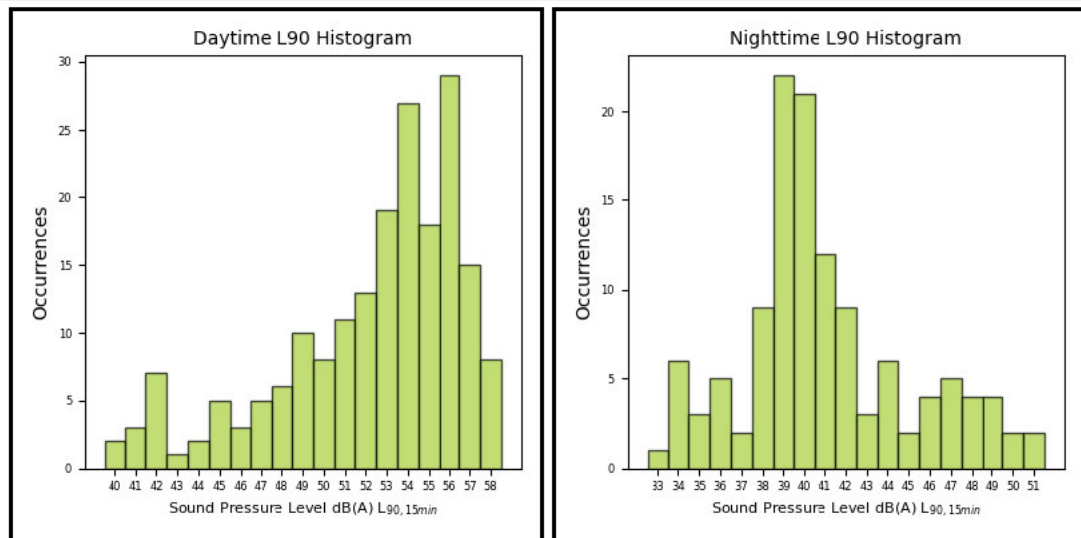


Figure 7: Background sound levels - ML1

3.3.2 Given the spread of daytime measured values, the shape of the distribution curve, we will base our assessment on the values:

- Day Background, ML1 52 dB, LAF90
- Night Background, ML1 39 dB, LAF90

3.3.3 Background sound values have been arrived at by taking the modal value that has not more than 45% of the measured values at a lesser level. This statistical method has been taken from the 4th edition of the Little Red Book of Acoustics

3.4 Commentary on Background sound

3.4.1 There is an elevation of noise levels on the Saturday night which, in turn, has caused Background levels to increase. This is most likely a result of street scene activity increasing and noise generated by the bar opposite the site.

4 PRO-PG:2017 SITE NOISE RISK ASSESSMENT AND ACOUSTIC DESIGN STATEMENT

4.1 Pro-PG:2017 Stage 1 Risk Assessment of Noise Levels

4.1.1 Based on the results of the noise survey as discussed in Section 3 of this report and in accordance with Pro-PG:2017, a Site Noise Risk Assessment (SNRA) has been conducted. The SNRA assesses the initial risk of noise to have an adverse impact on a proposed development based on the overall measured levels with no mitigation in place.

4.1.2 Our assessment is based on Figure 1 of Pro-Pg 2017, presented below in **Figure 8**.

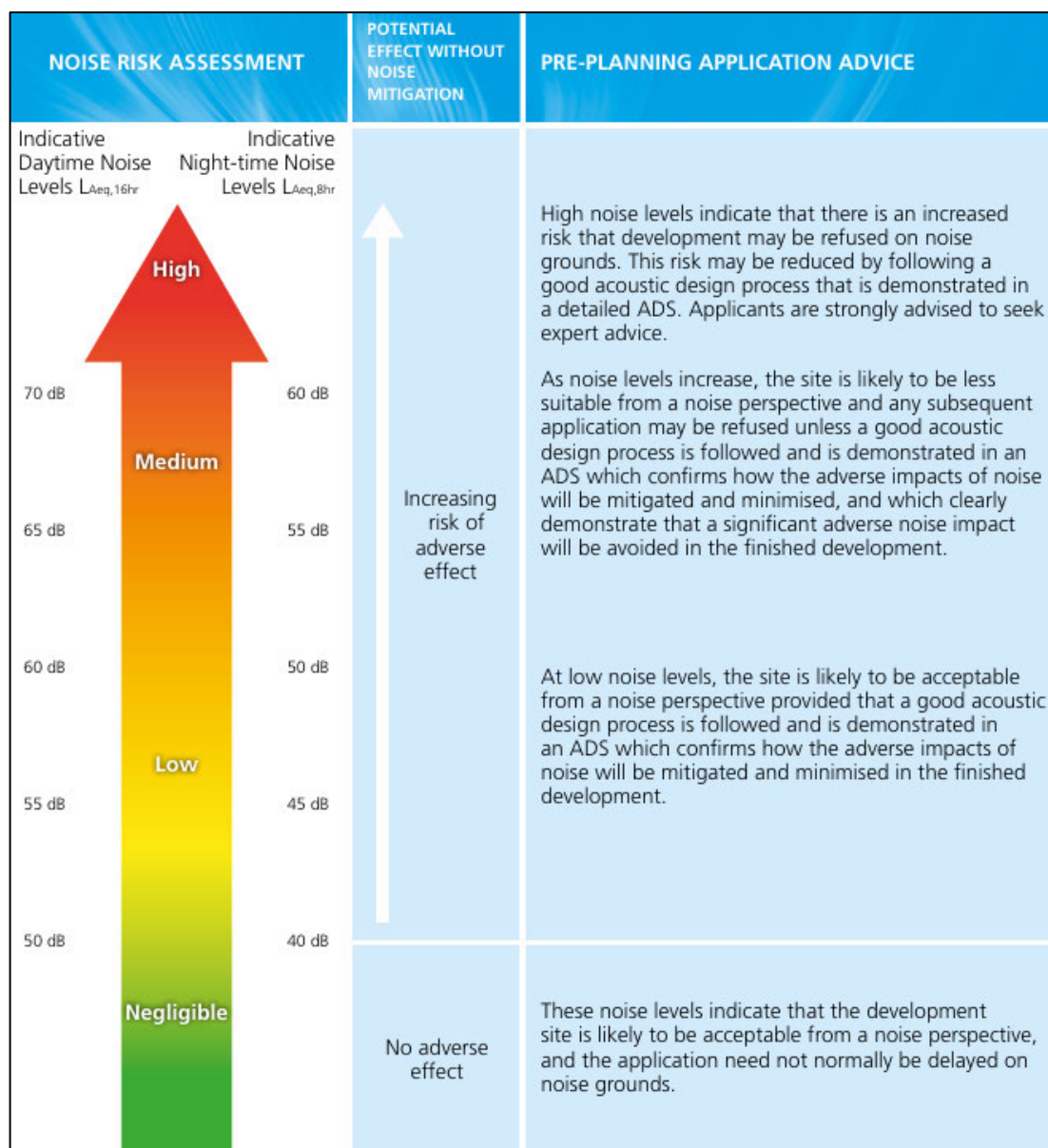


Figure 8: Pro-Pg 2017 (Figure 1)

4.1.3 The worst-case results have been compared to the information provided on Figure 1 of Pro-PG:2017.

Table 7: Stage 1 Risk Assessment of Noise Levels				
Receptor Point	Daytime Noise Level (dB L _{Aeq})	Risk of Adverse Effect	Night-time Noise Level (dB L _{Aeq})	Risk of Adverse Effect
ML 1	63	Low/ Medium	56	Medium

4.1.4 **Table 7** indicates that during the daytime and night-time periods, proposed receptors of the development can be categorised as varying from ‘**Low to Medium**’ risk of adverse impact, depending on what part of the site / 24-hour cycle, the habitable room’s facade is located.

4.1.5 The Site Noise Risk Assessment shows that local noise mitigation and good acoustic design will be required to ensure that the potential risk of the noise impact is minimised, and guideline internal and external noise levels are achieved.

4.1.6 In accordance with Pro-PG:2017, a Stage 2 full noise assessment, which includes an acoustic design statement, is required to ensure future residents are protected and a good acoustic design has been implemented.

4.2 Pro-PG:2017 Stage 2 – Site Noise Risk Assessment

4.2.1 The results of the Pro-PG:2017 Stage 1: Initial Site Noise Risk Assessment shows that receptors at the proposed development are likely to be at a ‘**Low to Medium**’ risk of experiencing an adverse noise impact with no mitigation in place. Therefore, an assessment against the criteria in WHO and BS 8233:2014 has been undertaken with reference to the general sound levels at the site.

4.2.2 This section forms the Stage 2 Acoustic Design Statement.

4.3 Assessment of Daytime and Night-time Noise Levels in Living Rooms and Bedrooms

4.3.1 Predicted noise levels at the façades where habitable room windows are proposed, together with the level of attenuation required to achieve internal ambient noise level targets (IANL) of BS 8233: 2014, are presented in **Table 8**.

Table 8: Level of Attenuation Required to Achieve BS8233 IANL target levels.				
Detail	Noise Level Descriptor	Noise Level at the Façade of the Property (dB)	BS 8233:2014 Target IANL (dB)	Level of Attenuation Required (dB)
Bedroom	Daytime, L _{Aeq,16hours}	63	35	28
	Night-Time, L _{Aeq,8hours}	56	30	26
	Night-Time, L _{Amax}	78	45	33

4.4 Building Envelope Performance – Windows Partially Open

4.4.1 A partially open window is one that is typically defined as that where not more than 10% of the available window area is open to the outside world. With windows open in this way, the

attenuation provided by the façade will be approximately 10 -15 dB. Our assessment is based on this criterion and the attenuation being 12 dB.

4.4.2 **Table 9** shows the likely level of exceedance for partially open windows at the site.

Table 9: Summary of Internal Noise Levels with Windows Partially Open (based on a Partially Open Window Providing up to 12 dB Attenuation).			
Room Type	Day / Night	Yes / No	Excess (dB)
Bedroom	Day	No	+16
	Night	No	+21

4.4.3 In accordance with BS 8233:2014, an exceedance of up to 5 dBA, can be acceptable to future residents and consequently, is unlikely to breach the LOEL criteria discussed in Section 2 of this report.

4.4.4 Where exceedances are likely to be greater than +5 dBA, on occasions, this may be acceptable to a resident, but when quiet conditions are required, the resident should be able to close the windows, whilst maintaining adequate background ventilation.

4.4.5 Given this information and the details of **Table 9** above, an open window is highly unlikely to be acceptable on the site. It is the view of NoiseAir that a closed window strategy with either active or passive ventilation will be required to supply the required background ventilation.

4.4.6 It should be noted that openable windows should still be made available to future residents. This is for the purpose of purge ventilation.

5 SOUND INSULATION SCHEME

5.1 Site overview

- 5.1.1 The dominant noise source affecting the site is traffic using the road network. Traffic is evident from elsewhere, but to an overall lesser degree. Pedestrian activity from the street scene below is a significant noise source but more so at the weekend.

5.2 Building Envelope Requirements

- 5.2.1 Noise sensitive rooms will likely be located on all facades of the site. The targets for internal ambient noise levels are proposed as being required to not exceed:

- 35 dB $L_{Aeq,T}$ during the daytime hours in all rooms
- 30 dB $L_{Aeq,T}$ during the night-time in bedrooms
- Not typically exceed 45 dB $L_{Amax,t}$ more than 10 times a night in bedrooms

- 5.2.2 When assessing sound levels in habitable areas of the proposed development, the sound attenuation provided by the overall building facade should be considered. Glazing and passive ventilation are usually those building elements which attenuate noise the least. Consequently, the acoustic performance and relative proportion of glazing in a space's facade is of critical importance, as is the acoustic performance of any passive ventilation.

- 5.2.3 The ventilation strategy will be assessed in conjunction with the glazing.

- 5.2.4 The contribution to noise ingress from the inherently higher acoustic performance of the wall and roof fabrics will be calculated using R values for standard constructions. See **Table 11** below for details.

- 5.2.5 Based on the design details forwarded, worst case façade attenuation calculations have been undertaken in accordance with the rigorous method found in BS 8233:2014.

5.3 Suggested façade elements – Glazing / Ventilation – Passive ventilation

- 5.3.1 A scheme is proposed, to accommodate the measured day/ night variations in noise, across the proposed site.

- 5.3.2 On all facades, we suggest glazing that achieves a sufficient level of acoustic performance in conjunction with a relatively higher specification of passive ventilation. Where appropriate, we have assumed up to two trickle vents per habitable room or, if required one acoustic wall vent.

- 5.3.3 It should be noted that ventilation design / assessment is outside the scope of this report and should be assessed by a competent person.

5.3.4 Plans indicate glazing is to be fitted to all habitable rooms. It should be noted that glazing is an acoustically weakest point of the façade.

5.3.5 **Table 10** presents the required 'R' values of different elements for habitable rooms.

Table 10: Glazing / Ventilation Scheme Key and minimum requirements									
Element	R _w /D _{ne,w} (dB)	Octave band (Hz) R values (dB)							
		63	125	250	500	1K	2K	4K	8K
Ventilation	40	29	35	35	39	43	46	60	63
Glazing	36	22	28	29	39	44	50	61	64
Wall	48	31	37	42	52	60	63	68	71
Roof / ceiling	39	23	27	37	43	48	52	52	55

5.3.6 The acoustic performance values that have been predicted to be required are presented below in **Table 10**. They are the minimum R values required of each element. Any product install will need to be met or exceeded in all octave bands. Furthermore, the above specifications are based on the plans forwarded to NoiseAir. Therefore, any changes to location, size and orientation will require re-assessment.

5.3.7 **Table 11** below provides a typical example summary for each element type outlined in **Table 10** above.

Table 11: Summary of Building Element - Typical Examples – Manufacturers data		
Element Type	Single figure value	Typical Example
Wall	48 dB R _{w+Ctr}	Double leaf, 112 mm brickwork, 50 mm cavity, rigid wall ties
Roof	39 dB R _{w+Ctr}	Tiled/slatted roof, 25mm plasterboard ceiling, 100 mm quilt above ceiling
Window (example)	36 dB R _{w+Ctr}	SG Stapid Silence 8.4:12:10.8 SG Stadip Silence (mm)
Vent (1 of) (example)	40 dB D _{ne,w+Ctr}	Greenwood AAB 4000 (Passive) Acoustic Wall Ventilator

5.3.8 The examples provided in **Table 11** are for guidance only. Any adopted solution must achieve the acoustic performance values presented in **Table 10**.

5.4 Commentary on Mechanical Ventilation

5.4.1 A MVHR system 4 is predicted not to be specifically required. If a mechanical ventilation system is desired it will likely use closed windows with no openings for passive background ventilation.

5.4.2 The MVHR system will need to have its internal noise output limited. For mechanical fan-based systems this is normally given in terms of NR curve values. The limits, as experienced in the respective rooms and due solely to the ventilation system are:

- Not more than NR 20 in Bedrooms during the night-time; and,
- Not more than NR 25 in Living rooms.

5.4.3 Ultimately, both ventilation systems suggested will rely on the windows being openable. This functions to allow for purge ventilation, for short periods, if and when it is required.

5.5 General Ventilation Requirements

5.5.1 It is recommended that the ventilation system proposed at the site should, as a minimum, comply with Building Regulations 2010 Approved Document F1 2021 Means of Ventilation and British Standard BS5925 1991: "Code of Practice for Ventilation Principles and Designing for Natural Ventilation".

5.5.2 As detailed in this section, it is likely that noise levels in noise sensitive rooms within the proposed rooms will likely rely on the windows being in the closed position and therefore appropriate ventilation design should be completed.

5.5.3 The implementation of the recommended glazing would ensure that the required internal daytime and night-time noise limits are likely achieved.

5.5.4 It should be further noted that the glazing configurations within this report are for guidance only. Similar products to those used in NoiseAir calculations may achieve a similar level of sound reduction, however this should be verified by the manufacturer.

5.6 Overheating

5.6.1 Building Regulations Approved Document O Overheating: 2021 describes two methods for an overheating assessment as follows:

- A simplified method
- Dynamic Thermal Modelling method

5.6.2 The document discusses how windows are likely to be closed during sleeping hours if noise levels within bedrooms exceed $L_{Aeq,8hours}$ 40 dB and / or L_{AFMax} 55 dB more than 10 times a nig, when the windows are open (based on a 13 dB reduction due to noise passing through an open window). Therefore, because measurements at ML1 indicate internal noise levels, with an open window in excess of these targets, a dynamic thermal modelling options becomes the requirement.

5.6.3 Given the levels at the proposed development exceed, the aforementioned external levels and acceptable internal noise levels will likely rely on the majority of windows being closed, dynamic thermal modelling is required for the development site, and the windows will need to be considered as closed within any overheating assessment.

5.6.4 It should be noted that the assessment of overheating is outside the scope of this report.

6 BS4142 ASSESSMENT OF PLANT NOISE

6.1 New Plant associated with the proposed

6.1.1 It is most likely that any new plant installation will be located on the rear of the site. The adopted background sound levels at the rear are:

- Day Background, ML2 52 dB, LAF90
- Night Background, ML2 39 dB, LAF90

6.1.2 It is not possible to present a detailed assessment of new plant noise impact if there are no design details on which to base the assessment on. In this instance we present noise limits, as experienced at the facade of the worst affected NSR, that are not to be exceeded. In principle, limits are based on the noise due to plant (defined as the 'Specific' sound level) should then have character corrections applied. The resulting noise level (defined as the 'Rated' sound level) should not exceed the prevailing background sound level.

6.1.3 We suggest a prospective 5 dB character correction be applied to any future plant installations 'specific' sound level. Therefore, the plant noise limit, as experienced at the NSR should not exceed:

- Day: $52 - 5 = 47$ dB, LAeq,t
- Night: $39 - 5 = 34$ dB, LAeq,t

6.1.4 Adhering to this protocol is predicted to result in a low impact at the NSR, depending on context.

7 SOUND INSULATION: COMMERCIAL TO RESIDENTIAL

7.1 Overview

- 7.1.1 The site is proposed to have commercial space adjacent to the site. Where commercial space is attached to residential space the building regulations state:

Protection against sound from other parts of the building and adjoining buildings

E1. Dwelling-houses, flats and rooms for residential purposes shall be designed and constructed in such a way that they provide reasonable resistance to sound from other parts of the same building and from adjoining buildings.

Figure 9: Building regulations part E requirements

- 7.1.2 Whilst the sound insulation of a partition with residential space on either side is assessed via a quantifiable standardised test procedure, as part of building regulation part E, there is no such quantified criteria to be tested between commercial and residential spaces, only the qualitative statement above.
- 7.1.3 There is a buffer space proposed between the commercial and residential in the form of a bicycle and bin store. The considerable cavity that is created by this space indicates that the noise reduction between commercial and residential spaces at ground floor level will also be considerable. Consequently, no further assessment of the wall partitions in this area of the proposed is required. See **Figure 10** below for details.

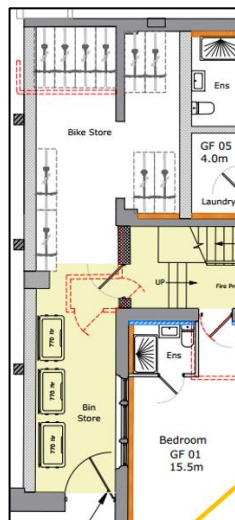


Figure 10: Bicycle and bin store between Commercial and residential space

- 7.1.4 It is noted however that a bedroom is proposed over the area of the proposed units. Noise emissions in this area are unlikely to exceed an average level of 75 dB(A). Therefore we recommend that the separating ground floor achieves a performance requirement of 50 dB $D_{nt,w}+C_{tr}$.

8 CONCLUSIONS

8.1 Overview

- 8.1.1 By instruction from Investment Street Ltd, 22 Towcester Road, Milton Keynes, NoiseAir was commissioned to undertake a noise assessment of Old Post Office Building, Station Road, Hinckley LE10 1AW in support of future planning application(s)

8.2 Conclusions

- 8.2.1 From a noise point of view, this is deemed possible, given adequate consideration to façade elements and the location and noise level emitted by the proposed plant room associated with the proposed development.
- 8.2.2 Two acoustic specifications of glazing and passive ventilation will be required to all habitable rooms. The glazing required is a mid-range specification.
- 8.2.3 The specification contained in this report state octave band R values that all elements of a given window opening, will need to achieve or exceed. As such, care must be taken to ensure all gaps are filled and are not too big and that the frame as well as the glazing unit fulfil the criteria required of them.
- 8.2.4 We have specified performance targets for both the window units and passive ventilation, to be installed, as separate specifications for the front.
- 8.2.5 The measured levels indicate that active mechanical ventilation, in conjunction with closed windows, is not required but can be used if desired.
- 8.2.6 Details of noise limits have been provided, to aid in any future installation of plant, such that it does not cause an adverse noise impact on future residents of the dwellings nearest to the site.
- 8.2.7 The 1st – 2nd floor partition will likely be requiring an improvement on any structural requirements, so that it provides a level of sound insulation that accommodates the likely greater noise levels that the commercial planning class of the first floor allows for.

APPENDIX A - REPORT LIMITATIONS

This Report is presented to Investment Street Ltd, 22 Towcester Road, Milton Keynes and may not be used or relied on by any other person or by the client in relation to any other matters not covered specifically by the scope of this report.

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APPENDIX B – GLOSSARY

A-weighted sound pressure, p_A	Value of overall sound pressure, measured in pascals (Pa), after the electrical signal derived from a microphone has been passed through an A-weighting network. <i>NOTE: The A-weighting network modifies the electrical response of a sound level meter with frequency in approximately the same way as the sensitivity of the human hearing system.</i>
A-weighted sound pressure level, L_{pA}	Quantity of A-weighted sound pressure in decibels (dBA).
Acoustic environment	Sound from all sound sources as modified by the environment [BS ISO 12913-1:2013].
Ambient sound	Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far. <i>NOTE: The ambient sound comprises the residual sound and the specific sound when present.</i>
Ambient sound level, $L_a = L_{Aeq,T}$ (BS 4142:2014)	Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T <i>NOTE: The ambient sound level is a measure of the residual sound and the specific sound when present.</i>
Background sound	Underlying level of sound over a period, T, which might in part be an indication of relative quietness at a given location.
Background sound level, $L_{A90,T}$ (BS 4142:2014)	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels.
Break-in	Noise transmission into a structure from outside.
Break-out	Noise transmission from inside a structure to the outside.
Cross-talk	Noise transmission between one room and another room or space via a duct or other path.
C_{tr}	Correction term applied against the sound insulation single-number values (R_w , D_w , and $D_{nT,w}$) to provide a weighting against low frequency performance. <i>NOTE: The reference values used within the C_{tr} calculation are based on urban traffic noise.</i>
Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$	Value of the A-weighted sound pressure level in decibels (dB) of a continuous, steady sound that, within a specified time interval, T, has the same mean-squared sound pressure as the sound under consideration that varies with time.
Equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$ (BS 4142:2014)	Value of the A-weighted sound pressure level in decibels of continuous steady sound that, within a specified time interval, $T = t_2 - t_1$, has the same mean-squared sound pressure as a sound that varies with time.
Equivalent sound absorption area of a room, A	Hypothetical area of a totally absorbing surface without diffraction effects, expressed in square metres (m ²), which, if it were the only absorbing element in the room, would give the same reverberation time as the room under consideration
Facade level	Sound pressure level 1 m in front of the façade. <i>NOTE: Facade level measurements of L_{pA} are typically 1 dB to 2 dB higher than corresponding free-field measurements because of the reflection from the facade.</i>

Free-field level	Sound pressure level away from reflecting surfaces. <i>NOTE: Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field. To minimize the effect of reflections the measuring position has to be at least 3.5 m to the side of the reflecting surface (i.e. not 3.5 m from the reflecting surface in the direction of the source). Estimates of noise from aircraft overhead usually include a correction of 2 dB to allow for reflections from the ground.</i>
Impact sound pressure level, L_i	Average sound pressure level in a specific frequency band in a room below a floor when it is excited by a standard tapping machine or equivalent.
Indoor ambient noise	Noise in a given situation at a given time, usually composed of noise from many sources, inside and outside the building, but excluding noise from activities of the occupants. <i>NOTE: The location(s) within the room at which the ambient indoor noise is to be measured or calculated ought to be considered.</i>
Measurement time interval, T_m (BS 4142:2014)	Total time over which measurements are taken. <i>NOTE: This may consist of the sum of a number of non-contiguous, short-term measurement time intervals.</i>
Noise criteria	Numerical indices used to define design goals in a given space.
Noise rating, NR	Graphical method for rating a noise by comparing the noise spectrum with a family of noise rating curves.
Normalised impact sound pressure level, L_n	Impact sound pressure level normalized for a standard absorption area in the receiving room. <i>NOTE: Normalised impact sound pressure level is usually used to characterize the insulation of a floor in a laboratory against impact sound in a stated frequency band.</i>
Octave band	Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit.
Percentile level, $L_{AN,T}$	A-weighted sound pressure level obtained using time-weighting "F," which is exceeded for $N\%$ of a specified time interval.
Reference time interval, T_r (BS 4142:2014)	Specified interval over which the specific sound level is determined. <i>NOTE: This is 1 h during the day from 07:00 h to 23:00 h and a shorter period of 15 min at night from 23:00 h to 07:00 h.</i>
Residual sound (BS 4142:2014)	Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.
Residual sound level, $L_r = L_{Aeq,T}$ (BS 4142:2014)	Equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, T .
Rating level, $L_{Ar,T}$	Equivalent continuous A-weighted sound pressure level of the noise, plus any adjustment for the characteristic features of the noise. <i>NOTE: This is used in BS 7445 and BS 4142 for rating industrial noise, where the noise is the specific noise from the source under investigation.</i>
Reverberation time, T	Time that would be required for the sound pressure level to decrease by 60 dB after the sound source has stopped.
Sound exposure level, L_{AE}	Level of a sound, of 1 s duration, which has the same sound energy as the actual noise event considered.
Sound level difference, D	Difference between the sound pressure level in the source room and the sound pressure level in the receiving room.
Sound pressure, p	Root-mean-square value of the variation in air pressure, measured in pascals (Pa) above and below atmospheric pressure, caused by the sound.

Sound pressure level, L_p	Quantity of sound pressure, in decibels (dB).
Sound reduction index, R	Laboratory measure of the sound insulating properties of a material or building element in a stated frequency band.
Specific sound level, $L_s = L_{Aeq,T_r}$ (BS 4142:2014)	Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r .
Specific sound source (BS 4142:2014)	Sound source being assessed.
Standardised impact sound pressure level, L_{nT}	Impact sound pressure level normalized to a reverberation time in the receiving room of 0.5 s.
Standardised level difference, D_{nT}	Difference in sound level between a pair of rooms, in a stated frequency band, normalized to a reference reverberation time of 0.5 s for dwellings.
Ground borne noise	Audible noise caused by the vibration of elements of a structure, for which the vibration propagation path from the source is partially or wholly through the ground. <i>NOTE Common sources of ground-borne noise include railways and heavy construction work on adjacent construction sites.</i>
Structure-borne noise	Audible noise caused by the vibration of elements of a structure, the source of which is within a building or structure with common elements. <i>NOTE Common sources of structure-borne noise include building services plant, manufacturing machinery and construction or demolition of the structure.</i>
Third octave band	Band of frequencies in which the upper limit of the band is 2% times the frequency of the lower limit.
Weighted level difference, D_w	Single-number quantity that characterizes airborne sound insulation between rooms, but which is not adjusted to reference conditions. <i>NOTE Weighted level difference is used to characterize the insulation between rooms in a building as they are. Values cannot normally be compared with measurements made under other conditions (see BS EN ISO 717-1).</i>
Weighted normalised impact sound pressure level, $L'_{n,w}$	Single-number quantity used to characterize the impact sound insulation of floors over a range of frequencies.
Weighted sound reduction index, R_w	Single-number quantity which characterizes the airborne sound insulating properties of a material or
Weighted standardised impact sound pressure level $L'_{nT,w}$	Single-number quantity used to characterize the impact sound insulation of floors over a range of frequencies.
Weighted standardised level difference, $D_{nT,w}$	Single-number quantity that characterizes the airborne sound insulation between rooms.

Symbols

D_w	Weighted level difference (dB)
D_{nT}	Standardized level difference (dB)
$D_{nT,w}$	Weighted standardized level difference (dB)
L_{Amax}	Maximum noise level (dB)
L_{Ar,T_r}	Rating level (dB)
L_n	Normalised impact sound pressure level (dB)
L'_{nT}	Standardised impact sound pressure level (dB)
$L'_{nT,w}$	Weighted standardised impact sound pressure level (dB)
$L'_{n,w}$	Weighted normalised impact sound pressure level (dB)
L_p	Sound pressure level (dB)
L_{pA}	A-weighted sound pressure level (dB)
$L_{AN,T}$	Percentile level (dB)
L_{AE}	Sound exposure level (dB)
$L_{Aeq,T}$	Equivalent continuous A-weighted sound pressure level (dB)
p	Sound pressure (Pa)
p_A	A-weighted sound pressure (dB)
$p_{A(t)}$	Instantaneous A-weighted sound pressure (Pa)

R	Sound reduction index (dB)
R_w	Weighted sound reduction index (dB)
T	Time interval (also used for reverberation time) (s)
t_0	Reference time interval (s)

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