



Property Investment Complete Ltd
26 Silver Street, Bury
Residential Noise Impact Assessment
DC4652-NR1



Report Version Issue Log

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Limitations to this Report

This report entails a physical investigation of the site with a sufficient number of sample measurements to provide quantitative information concerning the type and degree of noise affecting the site. The objectives of the investigation have been limited to establishing sources of noise material to carrying out an appropriate assessment.

The number and duration of noise measurements have been chosen to give reasonably representative information on the environment within the agreed time, and the locations of measurements have been restricted to the areas unoccupied by building(s) that are easily accessible without undue risk to our staff.

As with any sampling, the number of sampling points and the methods of sampling and testing cannot preclude the existence of “hotspots” where noise levels may be significantly higher than those actually measured due to previously unknown or unrecognised noise emitters. Furthermore, noise sources may be intermittent or fluctuate in intensity and consequently may not be present or may not be present in full intensity for some or all of the survey duration.

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1.0 INTRODUCTION

1.1 Details of Instruction

Property Investment Complete Ltd has appointed Dragonfly Consulting to carry out a Noise Impact Assessment in support of a planning application for a proposed residential development at 26 Silver Street, Bury.

The noise assessment has been conducted with reference to the National Planning Policy Framework and the appropriate British Standards, recognised guidance and reference documents relevant to this site.

A glossary of technical terminology is included in Appendix A.

1.2 Site Description

The development site is located on the corner of the intersection between Silver Street and Bank Street, Bury. The site is bound by:

- 'Hidden Bar' and 'Club 66 Bar and Night Club' night-club to the north;
- 'The Fusilier Museum' and 'Gallipoli Garden and Memorial Wall' to the east;
- The 'Library Gardens' and 'Bury Unitarian Church' to the south;
- An assortment of office buildings to the west, with a car park and railway line further afield; and,
- A mix of entertainment venues and commercial and residential developments that comprise Bury Town Centre further afield.

It should be noted that 'Club 66 Bar and Night Club' night-club has been closed and will not be reopening in the foreseeable future. As such, it has not been included within this assessment.

It is proposed that the building be converted into nine (9no.) individual dwellings across the ground, mezzanine and first floor levels, with associated bin/recycling and cycle stores on the ground floor level.

The proposed ground floor plan for the development, indicative of the site's layout, is presented in Figure 1.1, overleaf.

Figure 1.1
Indicative Site Plan



2.0 GUIDANCE

2.1 Local Guidance

2.1.1 Consultation with Local Authority

Dragonfly Consulting has not communicated directly with Bury Council (BC) regarding this proposal. However, Dragonfly Consulting has completed similar assessments at comparable sites recently so is aware of the normal requirements.

2.1.2 Local Plan

BC have adopted the Places for Everyone Joint Plan (PfE), which has been employed by the Greater Manchester area, as of March 2024. The council is currently implementing a new Local Development Plan (LDP) that will act in conjunction with the PfE. As such, unless the PfE supersedes the policies, the Bury Unitary Development Plan (UDP), adopted in August 1997, is therefore deferred to for guidance. The UDP includes the planning policies relevant to noise which inform the council's decisions on planning applications. Additional Supplementary Planning Documents (SPDs), which provide further guidance on the implementation of the UDP, are also referred to. The policies that are considered most relevant to this assessment are shown below.

Policy "H2/4 - Conversions", which is also referred to in "SPD 15 - Residential conversions", states:

"Applications for the conversion of buildings into two or more self-contained units, or the conversion of a building into a house of multiple occupation, will be considered with regard to the following factors:

- *the effect on the amenity of neighbouring property through noise, visual intrusion, the position of entrances, impact of parking areas, extensions and fire escapes*

(...)

Justification

Given the trend towards smaller households, the conversion of buildings into self contained units and houses in multiple occupation can be an effective way of providing small, relatively low cost accommodation. However, it is necessary to ensure that dwelling standards are maintained and to ensure that, generally, an over provision of such property does not adversely affect the need to maintain a good mix of housing types, or adversely affects the character and amenity of residential areas."

Policy "EN7/2 - Noise Pollution" further states:

"In seeking to limit noise pollution the Council will not permit:

(...)

development which could lead to an unacceptable noise nuisance to nearby occupiers and/or amenity users

Justification

Noise is an environmental problem which can cause damage to people's health as well as the amenity of an area. This policy seeks to control the location of development in relation to noise pollution in order to reduce the impact of this form of pollution. Proposals for noisy developments likely to generate an unacceptable noise nuisance will not be permitted. Similarly, proposals for development close to permanent noise sources, such as motorways will not be permitted where it would lead to unacceptable noise nuisance for the occupiers or users of the proposed development. In certain cases, there may be opportunities to prescribe forms of screening, mounding and landscaping to reduce the impact of noise, which will benefit the quality of life for people living and working close to areas where there is noise generation or a noise pollution problem."

2.2 National Guidance

2.2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. At the heart of the NPPF is a presumption in favour of sustainable development. It requires Local Plans to be consistent with the principles and policies set out in the NPPF with the objective of contributing to the achievement of sustainable development.

The NPPF states that the planning system has three overarching objectives in achieving sustainable development including a requirement to 'contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.'

Paragraph 180 of the NPPF states:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

...

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability."

Additionally, Paragraph 191 of the NPPF states:

"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..."

2.2.2 Noise Policy Statement for England

The document ‘Noise Policy Statement for England’ (NPSE) sets out the following vision for ongoing noise policy:

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

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.”*

To achieve this vision, the Noise Policy Statement sets 3 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.

SOAEL – Significant Observed Adverse Effect Level

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

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 taking into account the guiding principles of sustainable development... This does not mean that such adverse effects cannot occur.”

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.

2.2.3 Planning Practice Guidance for Noise (NPPG)

With reference to the NPPF and NPSE above, further guidance is given within the Noise Exposure Hierarchy Table forming part of the Planning Practice Guidance for Noise:

Table 2.1
Noise Exposure Hierarchy Table – Planning Practice Guidance for Noise

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

With respect to addressing potential conflict between new residential development and existing businesses in the immediate area, the NPPG states the following:

“Development proposed in the vicinity of existing businesses, community facilities or other activities may need to put suitable mitigation measures in place to avoid those activities having a significant adverse effect on residents or users of the proposed scheme.

In these circumstances the applicant (or ‘agent of change’) will need to clearly identify the effects of existing businesses that may cause a nuisance (including noise, but also dust, odours, vibration and other sources of pollution) and the likelihood that they could have a significant adverse effect on new residents/users. In doing so, the agent of change will need to take into account not only the current activities that may cause a nuisance, but also those activities that businesses or other facilities are permitted to carry out, even if they are not occurring at the time of the application being made.

The agent of change will also need to define clearly the mitigation being proposed to address any potential significant adverse effects that are identified. Adopting this approach may not prevent all complaints from the new residents/users about noise or other effects, but can help to achieve a satisfactory living or working environment, and help to mitigate the risk of a statutory nuisance being found if the new development is used as designed (for example, keeping windows closed and using alternative ventilation systems when the noise or other effects are occurring).”

2.3 British Standards and Guidance Documents

2.3.1 ANC Green Book: Environmental Noise Measurement Guide

The ANC Green Book provides practical guidance around the measurement and analysis of environmental sound. Areas which are covered include the preparation, execution and reporting of site survey work, and some road signs through the maze of guidance and policy applicable to this work. It also outlines a number of industry standard practices for the determination of L_{Amax} as a design case.

2.3.2 Approved Document F1 – Means of Ventilation

Whilst not directly related to the acoustic performance and noise impact assessment covered within this report, Table 1.7 of the document provides the guidance with respect to minimum passive ventilator space installed within the external façade of spaces depending on the overall ventilation strategy.

2.3.3 British Standard (BS) 7445-1:2003

The assessment of noise impact for this development has been undertaken by measuring external noise levels in accordance with the guidance detailed in BS 7445-1:2003 *Description and Measurement of Environmental Noise – Part 1: Guide to Quantities and Procedures*.

This document defines the basic quantities to be used for the description of noise in community environments and describes basic procedures for the determination of these quantities.

The methods and procedures described in this British Standard are intended to be applicable to sounds from all sources, individually and in combination, which contribute to the total noise at a site. This British Standard does not specify limits for environmental noise.

2.3.4 British Standard (BS) 8233:2014

The scope of BS 8233:2014: *Sound insulation and noise reduction for buildings* is the provision of guidance for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations; the primary intention of these is to guide the design of new buildings or refurbished buildings undergoing a change of use rather than to assess the effect of changes in the external noise climate. The standard suggests suitable internal noise levels within different types of buildings, including residential dwellings, as shown in Table 2.2.

Table 2.2
Indoor Ambient Noise Levels in Spaces When They Are Unoccupied

Activity	Typical Situations	Design Range $L_{Aeq,T}$ dB	
		0700h to 2300h	2300h to 0700h
Resting	Living rooms	35	--
Dining	Dining Room / Area	40	--
Sleeping	Bedrooms	35	30

BS 8233:2014 states in Note 4 that:

“Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,f}$ depending on the character and number of events per night. Sporadic noise events could require separate values.”

BS 8233:2014 also suggests noise limits for external areas or a property such as gardens or balconies. It states that:

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

2.3.5 ProPG: Planning and Noise

The document ‘ProPG: Planning & Noise – Professional Practice Guidance on Planning & Noise’ provides advice for Local Planning Authorities, developers and their respective advisors and compliments government planning, noise policy and guidance. The document seeks to:

- Advocate full consideration of the acoustic environment from the earliest possible stage of the development control process;
- Encourage the process of good acoustic design in around new residential developments;
- Outline what should be taken into account in deciding planning applications for new noise sensitive developments;
- Improve understanding of how to determine the extent of potential noise impact and effect;

- Assist in the delivery of sustainable development.

Following the guidance in paragraph 17 of the NPPF, planning should always seek to secure high quality design and a good standard of amenity for all existing and future occupants of land and buildings. ProPG describes an acoustic design process which seeks to deliver the best acoustic outcome for the site.

Good Acoustic Design Objectives

With reference to the guidance set out within the ProPG, the following design objectives are considered to represent good acoustic design and are recommended for this site:

- Full consideration of the acoustic environment from the earliest possible stage of the development process;
- An integrated approach should be taken to achieve optimal acoustic conditions, both internally (inside noise sensitive parts of the building) and externally (in spaces to be used for amenity purposes);
- The basis of good acoustic design should avoid ‘unreasonable’ acoustic conditions and prevent ‘unacceptable’ acoustic conditions as defined by the ProPG. Necessary design compromises should ideally not adversely affect living conditions and the quality of life of inhabitants;
- Using fixed unopenable glazing for sound insulation purposes is generally unsatisfactory and should be avoided;
- Solely relying on sound insulation of the building envelope to achieve acceptable acoustic conditions in new residential development, when other methods could reduce the need for this approach, is not regarded as good acoustic design;
- Evidence should be provided that good acoustic design processes have been followed.

The ProPG empowers the assessing acoustician to assess the acceptability of any noise impact and to establish the need for acoustic mitigation measures by considering the guidance detailed in BS 8233:2014 whilst also giving consideration to the context of the site, along with other non-acoustic factors that may affect the need to bring forward a site that is not acoustically ideal.

However, in determining what acoustic conditions would be ‘unreasonable’ and ‘unacceptable’, the ProPG also sets out the following guidance:

“The more often internal L_{Aeq} levels start to exceed the internal L_{Aeq} target levels by more than 5dB, the more that most people are likely to regard them as “unreasonable”. Where such exceedances are predicted, applicants should be required to show how the relevant number of rooms affected has been kept to a minimum. Once internal L_{Aeq} levels exceed the target levels by more than 10 dB, they are highly likely to be regarded as “unacceptable” by most people, particularly if such levels occur more than occasionally. Every effort should be made to avoid relevant rooms experiencing “unacceptable” noise levels at all and where such levels are likely to occur frequently, the development should be prevented in its proposed form”.

Additionally, the ProPG makes an addendum to Note 4 of the internal noise level guidelines as stated in BS 8233:2014 (Figure 2 in the ProPG document), referring to the acceptability of internal night-time L_{AFMax} noise levels:

“...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 $L_{Amax,F}$ more than 10 times a night...”

Further to this, Note 5 of the internal noise level guidelines states the following:

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

2.3.6 ISO 9613 Attenuation of Sound during Propagation Outdoors

ISO 9613 presents a calculation methodology for the determination of the attenuation of sound outdoors. The methodology enables the prediction the levels of environmental noise at a distance from a variety of sources.

2.3.7 NANR 92 – ‘Noise from Pubs and Clubs’

The document highlights a series of potential methodologies and assessment criteria to devise a rigorous method to be utilised when assessing the impact of noise from pubs and clubs. One such methodology identified is the utilisation of Noise Rating (NR) curves as absolute criteria across the full frequency spectrum as opposed to a single, a-weighted, broadband value. An excerpt is shown overleaf:

“The authors have seen examples of consultants and some local authorities using A-weighted target values for music intrusion within residential properties, generally based on World Health Organisation values. However, it is generally considered inappropriate to use only A-weighted target levels for music noise intrusion, because the impact of the bass elements of the noise. A relatively common application of absolute criteria is to use Noise Rating Curves to provide a target level in design work. The attraction of using a NR Curve is that it provides an absolute limit value in each octave band, whereas using an A-weighted level means that for a given dB(A) value, the allowable level of low frequency noise depends on the noise level at other frequencies. For a situation where there is little mid and high frequency noise transmission, a higher level of bass will be allowable without exceeding the dB(A) limit.”

Whilst ‘inaudibility’ is inherently a subjective measure that is challenging to accurately quantify, it is considered that adherence with a criterion of no greater than NR25 at any frequency band assessed is a reasonable indicator of this within the test space. If the noise associated with the commercial use is proposed to continue beyond 2300h, it may be appropriate to use NR20 as the required threshold in order to minimise the risk of sleep disturbance.

3.0 ASSESSMENT CRITERIA

3.1 Potential Sources of Environmental Noise

The following sources of noise are considered in the context this site:

Table 3.1
Assessed Sources of Environmental Noise

Assessment	Relevant Methodology
Site suitability for residential development	BS 8233:2014 NR Curves

3.2 Selection of Noise Criteria

With reference to the guidance detailed in Section 2, the following criteria have been selected to determine the threshold of effect levels in the context of the National Planning Policy Framework and Noise Policy Statement for England.

Table 3.2
Assessment Criteria: BS 8233:2014

Effect Level	Criteria	Justification
Lowest Observed Adverse Effect Level (LOAEL)	Internal noise levels achieve the requirements of the BS 8233:2014 standard assuming windows are closed, and an additional source of ventilation is provided	Noise levels within the BS 8233 criteria whilst ensuring no conflict with acceptable levels of indoor air quality management are considered to be suitable
Significant Observed Adverse Effect Level (SOAEL)	Internal noise levels fail to achieve the BS 8233:2014 standard by more than 5dB assuming windows are closed, and an additional source of ventilation is provided	None - Planning guidance requires that impacts must be reduced below the SOAEL though mitigation, with adverse impacts above the Lowest Observable Adverse Impact Level (LOAEL) but below the SOAEL being mitigated as far as is reasonable.

Table 3.3
Assessment Criteria: Noise from Neighbouring Premises

Criteria	Justification
Predicted internal noise levels within proposed development below NR25 within all habitable rooms during daytime hours and NR20 within bedrooms during night-time hours whilst nearby commercial premises are operating	Noise Levels within Noise from Pubs and Clubs

With reference to the guidance within BS 8233:2014 and the 'ANC Green Book: Environmental Noise Measurement Guide' (ANC, 2019), the predicted internal levels have been assessed against the following criteria:

- $L_{Aeq,16h}$ (Daytime) – internal levels must not exceed 35dB $L_{Aeq,16h}$;
- $L_{Aeq,8h}$ (Night-time) – internal levels must not exceed 30dB $L_{Aeq,8h}$;
- L_{AFMax} (Typical) – the 95th percentile of all night-time L_{Amax} noise levels must not exceed 45dB L_{AFMax} .

With regard to the determination of the L_{Amax} design case, the ANC Green Book Notes:

"Only in the most extreme situations would it be appropriate to adopt the highest measured L_{Amax} value... as a descriptor of an appropriate design case. In most situations, an average, typical or modal value, specific to the time period in question, needs to be selected or derived from the survey data. The frequency of occurrence of specific L_{Amax} events is critical in determining their typicality (hence the importance of sample period selection during scoping) ... Some common approaches to selecting the Design Case L_{Amax} , for instance, include ranking events during an assessment period and selecting the n th value (NB sample period is critical), taking a 10th percentile 'high average' level or simply selecting an appropriate looking value 'by eye'."

As can be seen above, the approach adopted within the assessment is slightly more onerous than recommended within the ANC Green Book. By adopting the 95th percentile as the design case it is considered that the assessment presents a reasonable worst-case approach.

4.0 ENVIRONMENTAL NOISE SURVEY

Daytime and night-time measurements were undertaken from the 23rd to the 28th of May 2024. The noise measurements established typical external ambient and background noise levels at the site.

4.1 Survey Methodology

The equipment used during the survey is detailed in Appendix B. The sound level meter was calibrated before and after the measurements and no significant calibration drifts were found to have occurred (>0.2dB). All of the noise monitoring equipment had been calibrated to a traceable standard within the twenty-four months preceding the survey. Calibration certificates are available on request.

One (1no.) measurement location was surveyed in order to establish the typical noise levels at the proposed development site. The measurement location is hereby referred to in this report as follows:

- 'Location 1' – sound level meter situated 1m from the eastern façade of the building at first-floor level.

The measurement location is shown in Appendix C.

4.2 Survey Results

Continuous weather monitoring was undertaken alongside noise monitoring. All monitored noise data has been screened to remove samples influenced by adverse conditions. Table 4.1 provides a summary of periods excluded from the results due to adverse weather conditions; all other periods not excluded were considered suitable for noise monitoring.

Table 4.1
Excluded Periods

Date	Time Period Removed
23/05/24	1515h-2000h
26/05/24	0500h-0545h
	1100h-1145h
	1345h-1430h
	1500h-1700h
	1930h-2015h
27/05/24	0445h-0715h
	0845h-0900h
28/05/24	0730h-0830h
	0930h-1045h

Summaries of the measured noise levels are given in Table 4.2, overleaf. Note that the measured noise levels have been corrected by -3 dB to convert façade conditions to free field conditions. A full dataset can be provided on request.

Table 4.2
Summary of Measured Noise Levels – 23/05/24 to 28/05/24 – Free Field, dB

Location	Date	Period	Time (h)	L _{Aeq, T}	L _{A10}	L _{A90}	L _{AFMax}
1	23/05/24	Daytime	1500h-2300h	57.0	60.3	46.0	85.7
	23/05/24-24/05/24	Night-time	2300h-0700h	53.0	52.8	42.9	83.1
	24/05/24	Daytime	0700h-2300h	59.8	62.4	51.2	85.1
	24/05/24-25/05/24	Night-time	2300h-0700h	60.1	60.1	52.9	102.5
	25/05/24	Daytime	0700h-2300h	58.9	61.1	50.7	96.6
	25/05/24-26/05/24	Night-time	2300h-0700h	60.6	60.7	53.6	85.6
	26/05/24	Daytime	0700h-2300h	58.8	60.6	48.1	98.0
	26/05/24-27/05/24	Night-time	2300h-0700h	60.9	62.7	56.3	83.7
	27/05/24	Daytime	0700h-2300h	56.4	59.7	45.0	83.1
	27/05/24-28/05/24	Night-time	2300h-0700h	52.0	49.8	39.2	86.5
	28/05/24	Daytime	0700h-0930h	58.1	61.7	48.5	81.2

4.3 Observations and Comments

The noise environment during the attended portion of the survey was noted to be dominated by road traffic and pedestrian noise from Silver Street. It is expected that, due to the proximity of neighbouring night-clubs to the site, the noise environment during the night-time periods is dominated by entertainment noise.

5.0 ASSESSMENT

5.1 Site Noise Risk Assessment

Further to the guidance detailed in the ProPG, the site has initially been assessed to establish the risk of noise adversely affecting the site. This assessment assists in quantifying whether further consideration of noise impact is required which may lead to the introduction of specific noise mitigation measures to ensure that the principles of good acoustic design are met.

Based on the noise risk assessment matrix detailed in Figure 1 of the ProPG, taking account of the measured noise levels and the context of the site, it is considered that this site is subject to noise that generates a high risk of an adverse effect.

A high risk suggests that there is an increased risk that the development may be refused on noise grounds. As such, consideration should be given to how noise affects the site and any future developments. The development should take account of that noise risk in the form of a detailed Acoustic Development Statement which reflects good acoustic design principles in the layout of dwellings and the use of space, confirming that adverse impacts will be mitigated and minimised.

The introduction section within the ProPG states:

“The scope of this ProPG is restricted to the consideration of new residential development that will be exposed predominantly (see Section 2) to airborne noise from transport sources (noting that good professional practice should have regard to any reasonably foreseeable changes in existing and/or new sources of noise). New apartments, flats and houses are the most common type of new residential development, however, the guidance can also be applied to other types of residential developments such as residential institutions, care homes etc. Some of the content is relevant to other types of noise-sensitive development and to other sources of noise. However, detailed consideration of other noise sensitive development (such as schools and hospitals), other sources of noise (such as dominant noise from industrial, commercial or entertainment premises) and of ground-borne noise and vibration, is outside the scope of this document.”

5.2 Predicted Internal Noise Levels within Dwellings

5.2.1 Predicted Internal Levels – Partially Open Windows

Calculations of internal noise levels have been completed for the proposed development to demonstrate that suitable internal noise levels can be achieved within the most noise sensitive rooms.

The account for the attenuation afforded by a partially open window, a nominal correction of -15dB $D_{ne,w}$ has been applied.

The results of the assessment are presented in Table 5.1.

Table 5.1
Assessment of Noise Intrusion Levels – Open Windows (Natural Ventilation)

Location	External Noise Level			Internal Noise Level		
	$L_{Aeq,16h}$	$L_{Aeq,16h}$	$L_{Aeq,16h}$	$L_{Aeq,16h}$	$L_{Aeq,8h}$	L_{AFMax}
1	59.8	60.6	74.6	44.8	45.6	59.6

As shown in the Table above, the results of the assessment indicate that use of open windows to provide natural ventilation will not be sufficient to meet the requirements of BS 8233:2014.

5.2.2 In-Façade Mitigation

Based on the results of the assessment outlined above, an alternative glazing and ventilation strategy will be required to ensure noise levels within proposed dwellings on the extremities of the site fall within the criteria set within BS 8233:2014.

Detailed calculations have been undertaken in accordance with Annex G of BS 8233:2014 to determine appropriate solutions for the site.

Detailed plans for the proposed development, provided by Code 6 Architecture Ltd, have been measured for use within the calculations.

At the current design stage there is no fixed ventilation strategy for the development. The following ventilation strategy has been considered to demonstrate site suitability.

Table 5.2 provides an outline of an indicative specification which would be suitable for use on this site.

Table 5.2
Building Regulations Approved Document F Requirements

Approved Document F – Indicative Ventilation Strategy	Passive Ventilation Requirement within Habitable Spaces
Continuous mechanical supply and extract with heat recovery (MVHR)	No Requirement
<i>Please note, consideration for the requirements of Part F of the Building Regulations has been given to support the assessment of acoustic suitability only. Part F compliance should be determined through consultation with a qualified ventilation specialist</i>	

Table 5.3 presents a summary of the proposed specification. Please note, the below does not provide an exhaustive list of suitable options, but care should be taken to ensure the selected product meets the octave band performance requirements

Table 5.3
Example Glazing & Ventilation Strategy

Building Element	Example Unit	Minimum Recommended Sound Reduction Performance							$R_w + C_{tr}$	$D_{ne,w}$
		63	125	250	500	1000	2000	4000		
Glazing	Saint-Gobain Stadip Silence 12.4mm / 14mm / Planiclear 4mm / 14mm / Stadip Silence 8.4mm	34	33	38	47	55	57	62	44	-
Ventilation	MVHR	-	-	-	-	-	-	-	-	-

Façade performance calculations are not limited to the impact of glazing and ventilation systems. To account for the attenuation afforded by the external wall, the calculations include the performance

afforded by a typical masonry cavity wall (300mm – 380kg/m²). Table 5.4 details the expected external façade construction which has been assumed for the purpose of these calculations.

Table 5.4
SRI of External Wall, dB (R_w)

Frequency in Hz	63	125	250	500	1000	2000	4000	R _w
SRI of Façade	28.0	34.0	43.0	55.0	66.0	77.0	85.0	55

5.2.3 Predicted Internal Levels – Closed Window

Table 5.5, below, present the results of the predicted internal noise levels in the most effected rooms, for brevity, following incorporation of the specifications outlined in the Section above.

Table 5.5
Assessment of Noise Intrusion Levels – Closed Windows (Alternative Ventilation)

Unit	Room	External Noise Level			Internal Noise Level		
		L _{Aeq,16h}	L _{Aeq,8h}	L _{AFMax}	L _{Aeq,16h}	L _{Aeq,8h}	L _{AFMax}
1	Bedroom	59.8	60.6	74.6	18.6	25.0	21.5
2	Bedroom 1	59.8	60.6	74.6	22.5	28.9	25.4
3	Bedroom	59.8	60.6	74.6	19.0	25.3	22.2
4	Bedroom	59.8	60.6	74.6	19.1	25.4	21.9
5	Bedroom 1	59.8	60.6	74.6	22.6	29.0	25.2
6	Bedroom	59.8	60.6	74.6	18.3	24.7	21.0
7	Bedroom	59.8	60.6	74.6	18.9	25.0	22.5
8	Bedroom 1	59.8	60.6	74.6	22.4	28.7	25.6
9	Bedroom 1	59.8	60.6	74.6	18.6	24.8	21.9

As shown in the Table above, following incorporation of the alternative glazing and ventilation strategy, internal noise levels within habitable rooms are predicted to be compliant with the requirements of BS 8233:2014.

It is therefore considered that the calculated internal noise levels are below the LOAEL set for this project. The LOAEL is defined as:

LOAEL – Lowest Observed Adverse Effect Level – Internal noise levels achieve the requirements of the BS 8233:2014 standard assuming windows are closed, and an alternative source of ventilation is provided.

5.3 Assessment of Noise from Amplified Music

Entertainment noise from the adjacent neighbouring premises has been assessed in the context of meeting NR25 in all habitable rooms and NR20 in bedrooms. Table 5.6, overleaf, presents the worst-case measured noise levels L_{Aeq,15min} at the façade of the proposed development during both daytime and night-time operating hours of the neighbouring premises.

Table 5.6
Noise from Neighbouring Premises

Period	Sound Pressure Level, dB(Z)						
	63	125	250	500	1000	2000	4000
Daytime	71.4	60.4	55.3	54.0	54.0	49.3	43.8
Night-Time	76.8	63.7	58.2	60.3	59.5	53.7	47.4

Based on and following the incorporation of the specification outlined in Section 5.2.2 above, Tables 5.7 and 5.8 show the results of the noise breaking into the most noise sensitive room of the proposed development.

Table 5.7
Noise from Neighbouring Premises: Daytime (All Habitable Rooms)

	Sound Pressure Level, dB(Z)						
	63	125	250	500	1000	2000	4000
Internal	51.9	35.6	21.9	9.4	-0.2	-8.3	-18.9
NR 25	55.3	43.8	35.3	29.2	25	21.9	19.5
Difference	-3.4	-8.2	-13.4	-19.8	-25.2	-30.2	-38.4

Table 5.8
Noise from Neighbouring Premises: Night-Time (Bedrooms)

	Sound Pressure Level, dB(Z)						
	63	125	250	500	1000	2000	4000
Internal	54.8	36.4	22.3	13.2	2.8	-6.4	-17.8
NR 20	51.2	39.4	30.6	23.8	20	16.8	14.4
Difference	3.6	-3.0	-8.3	-10.6	-17.2	-23.2	-32.2

As demonstrated in Tables 5.7 and 5.8 above, following incorporation of the alternative glazing and ventilation strategy, predicted internal noise contributions from the neighbouring premises in the most noise sensitive room are predicted to be below NR25 during the daytime but above NR20 during the night-time.

It should be noted that the NR20 criteria is exceeded by 3.6dB at 63Hz only. This exceedance, which in the context of this site is unlikely to result in an increased risk of complaints, is deemed to be negligible. It is an established principle in planning terms, supported by previous appeal decisions, that residents living within this location would not reasonably expect the same level of protection from noise as could be expected if they were not living in the of the main commercial hub of Bury town centre.

5.4 Recommendation to Decision Makers

The ProPG recommends that the acoustician make one of the following recommendations to a decision maker when considering the suitability in noise terms of a site for residential development. The recommendations are as follows:

1. Planning consent may be granted without any need for noise conditions;
2. Planning consent may be granted subject to the inclusion of suitable noise conditions;

3. Planning consent should be refused on noise grounds in order to avoid significant adverse effects (“avoid”); or
4. Planning consent should be refused on noise grounds in order to prevent unacceptable adverse effects (“prevent”).

Based on the assessment of noise risk, the subsequent detailed noise impact assessment and taking account of the recommended mitigation measures, it is the recommendation of Dragonfly Consulting that:

“planning consent be granted subject to the inclusion of suitable noise conditions.”

5.5 Uncertainty

5.5.1 Survey

Given the duration of the survey and the use of the highest measured daytime and night-time noise levels to ascertain noise propagation across the site, it is considered that the limits of Class 1 sound level meters are the only limiting factor when considering survey uncertainty.

Standard equipment uncertainties have been considered by applying allowable tolerances minus the maximum allowable test laboratory uncertainties given in IEC 61672-1, as defined by Narang and Bell (Narang, P. and Bell, T., 2008. *New IEC standards and periodic testing of sound level meters. Proceedings of the Internoise, Shanghai, China, pp.26-29*).

The following table provides an overview of standard equipment uncertainties relevant to the SLM class utilised within the survey.

Table 5.9
Standard uncertainties using allowable tolerances minus test laboratory tolerances given in IEC 61672-1 (source: Narang and Bell, Table 14)

SLM Class	Frequency Weighting	Directional Response	Level Linearity	Toneburst Response	Calibrator (IEC 61672)	Supply Voltage	Combined Standard Uncertainty +/- dB
Class 1	0.5	0.5	0.4	0.25	0.125	0.05	0.9

5.5.2 Design Calculations

Where design calculations have been utilised to determine the required performance of the glazing and ventilation strategy for the scheme, the method outlined within Annex G of BS 8233 (which is based on the BS EN 12354-3 calculation methodology) has been followed. The expected precision of this calculation methodology is quoted as +/- 2dB.

5.5.3 Combined Uncertainty

Based on the information provided above, the combined Root Sum Squared (RSS) uncertainty for the assessment has been calculated as +/- 2.2dB.

5.6 Assertion of Competence

This assessment has been completed by Feargus Flanagan, Acoustic Consultant with responsibilities for completing acoustic reports on behalf of Dragonfly Consulting. I hold a Bachelor of Science in Music Technology from Birmingham City University and am an Associate Member of the Institute of Acoustics.

6.0 CONCLUSIONS

Property Investment Complete Ltd has appointed Dragonfly Consulting to carry out a Noise Impact Assessment in support of a planning application for a proposed residential development at 26 Silver Street, Bury.

The noise assessment has been conducted with reference to the National Planning Policy Framework and the appropriate British Standards, recognised guidance and reference documents relevant to this site.

6.1 Site Noise Risk Assessment

Based on the noise risk assessment matrix detailed in Figure 1 of the ProPG, taking account of the measured noise levels and the context of the site, it is considered that this site is subject to noise that generates a high risk of an adverse effect.

A high risk suggests that there is an increased risk that the development may be refused on noise ground. As such, consideration should be given to how noise affects the site and any future developments. The development should take account of that noise risk in the form of a detailed Acoustic Development Statement which reflects good acoustic design principles in the layout of dwellings and the use of space, confirming that adverse impacts will be mitigated and minimised.

For a site considered to be of high risk, it is not expected that noise should be a barrier to the development following the incorporation of the recommendations made above.

6.2 Predicted Internal Noise Levels

The assessment shows that, following the incorporation of the alternative glazing and ventilation strategy, internal noise levels within habitable rooms are predicted to be compliant with the requirements of BS 8233:2014.

It is therefore considered that the calculated internal noise levels are below the LOAEL set for this project. The LOAEL is defined as:

LOAEL – Lowest Observed Adverse Effect Level – Internal noise levels achieve the requirements of the BS 8233:2014 standard assuming windows are closed, and an additional source of ventilation is provided.

As such, these levels are considered to be acceptable and meet the requirements of the NPPF and the Noise Policy Statement for England.

6.3 Assessment of Noise from Amplified Music

The assessment demonstrates that, following incorporation of the alternative glazing and ventilation strategy, predicted internal noise contributions from the neighbouring premises in the most noise sensitive room are predicted to meet the Noise from Pubs and Clubs guidance of NR25 during the daytime and, whilst they do not meet the recommended NR20 during the night-time, the exceedance is expected to be negligible within the context of this site.

Appendix A – Glossary of Terminology

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0dB (the threshold of hearing) to over 120dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

Table A-1
Sound Levels Commonly Found in the Environment

Sound Level	Location
0dB(A)	Threshold of hearing
20 to 30dB(A)	Quiet bedroom at night
30 to 40dB(A)	Living room during the day
40 to 50dB(A)	Typical office
50 to 60dB(A)	Inside a car
60 to 70dB(A)	Typical high street
70 to 90dB(A)	Inside factory
100 to 110dB(A)	Burglar alarm at 1m away
110 to 130dB(A)	Jet aircraft on take off
140dB(A)	Threshold of Pain

Acoustic Terminology

dB (decibel) The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio between the root-mean-square pressure of the sound field and a reference pressure (2×10^{-5} Pa).

dB(A) A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies.

L_{Aeq} This is defined as the notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.

L₁₀ & L₉₀ If a non-steady noise is to be described, it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time. L₁₀ is the level exceeded for 10% of the time and is often used as a descriptor for road traffic noise. Similarly, L₉₀ is the level exceeded for 90% of the time and is often used to describe the background level. It is common practice to use the L₁₀ index to describe traffic noise.

L_{AMax} is the maximum A-weighted sound pressure level recorded over the period stated. L_{AMax} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment.

Appendix B – Monitoring Equipment

Table B-1
Noise Monitoring Equipment

Equipment	Serial Number
01dB Cube Sound Level Meter	10889
G.R.A.S 40CD Microphone	231555
01dB PRE22N Preamplifier	1610358
Castle GA607 Acoustic Calibrator	043074

Appendix C – Measurement Location Plan

Figure C-1
Noise Monitoring Location Plan



Measurement Location



Site Boundary