

58B Normandy Street Alton

Environmental Noise Survey and Noise Impact Assessment Report

31268/NIA1

24 January 2024

For:
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Document Control

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1.0 Introduction

Hann Tucker Associates Limited (Hann Tucker) has been commissioned Mr. Raj Jeyasingam to undertake a noise assessment for a site in Alton, Hampshire.

The site, which is located Normandy Street, is being considered for residential development. The proposals are for the conversion of an existing commercial building into 6No. flats.

The site is subject to road traffic noise from the surrounding roads, in particular Normandy Street itself which is subject to a high volume of road traffic.

Baseline noise conditions have been established by means of a detailed noise survey, presented herein. The findings have subsequently been used to assess the suitability of the site for residential use. Measures required to mitigate noise impacts for the proposed development (when operational) have been discussed in context with relevant national & local planning policies, design standards and good practice guides.

2.0 Objectives

To establish by means of an unmanned 96 hour survey the existing L_{Amax} , L_{Aeq} and L_{A90} environmental road, rail and air traffic noise levels at 3No. secure and accessible on-site positions, using fully computerised noise monitoring equipment in general accordance with British Standard BS 7445 "Description and measurement of environmental noise".

Based on the results of the unmanned survey, to undertake a noise assessment to assess the suitability of the proposed development for residential use in accordance with the Noise Policy Statement for England (NPSE), National Planning Policy Framework (NPPF), Planning Practice Guidance (ProPG), British Standard BS8233:2014 and Local Authority guidance/requirements.

To discuss noise mitigation and acoustic design solutions to achieve acceptable noise levels in residential areas.

3.0 Acoustic Terminology

For an explanation of the acoustic terminology used in this report please refer to Appendix A enclosed.



4.0 Site Description

4.1 Location

The site is located at 58B Normandy Street, Alton. The location is shown in the following Location Map.



Location Map showing site location.

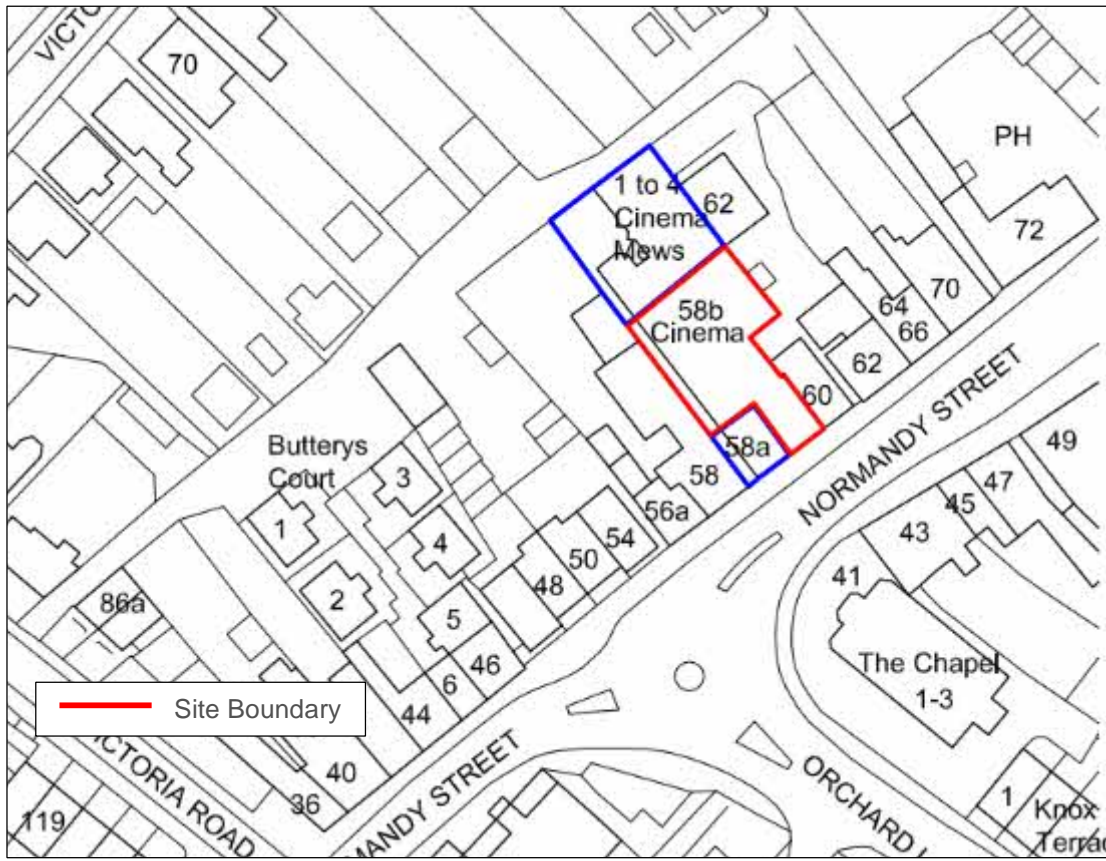
The site falls within the jurisdiction of East Hampshire District Council.

4.2 Description

The building comprises ground plus 2 storeys and was previously used as a cinema. The existing building comprises two cinema auditoriums; lobby spaces; projection rooms; ancillary stores located across the ground and first floors; and ancillary space for storage and staff use.

The surrounding context boasts a wide variety of building functions. Many of the properties within the site's immediate vicinity are residential, with some commercial use (chip shop and office). Other nearby building types are places of worship, a mechanic's garage, hotels, and a school. Normandy Street itself contains many terraced and semi-detached properties which are two storeys in height.

The site boundary is shown in red on the Site Plan on the following page.

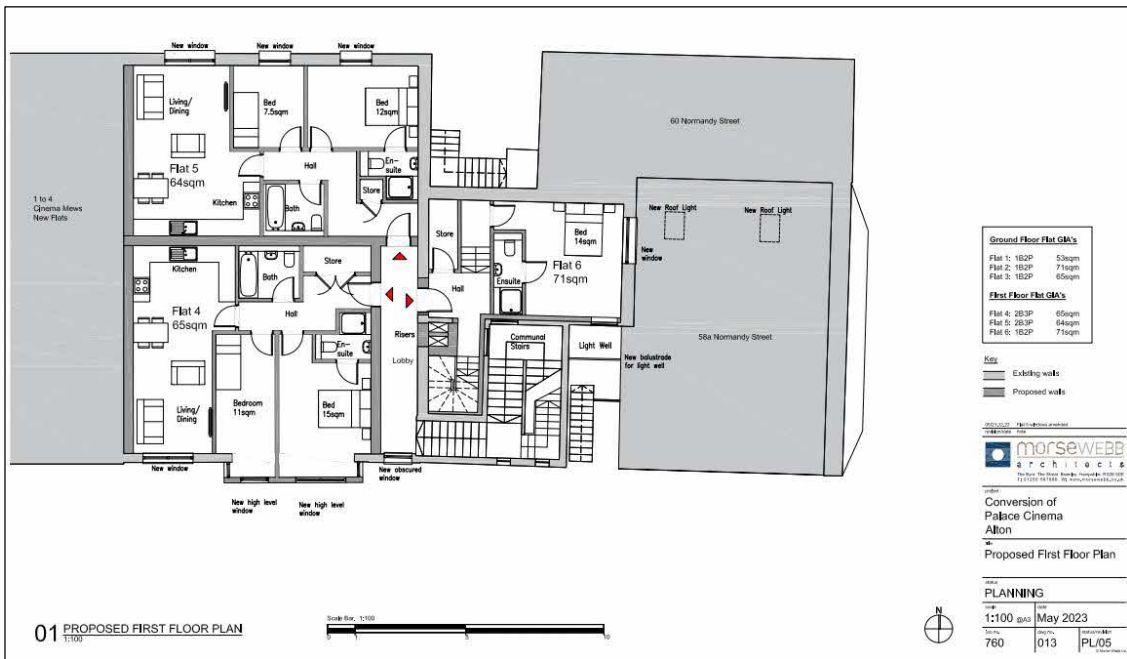
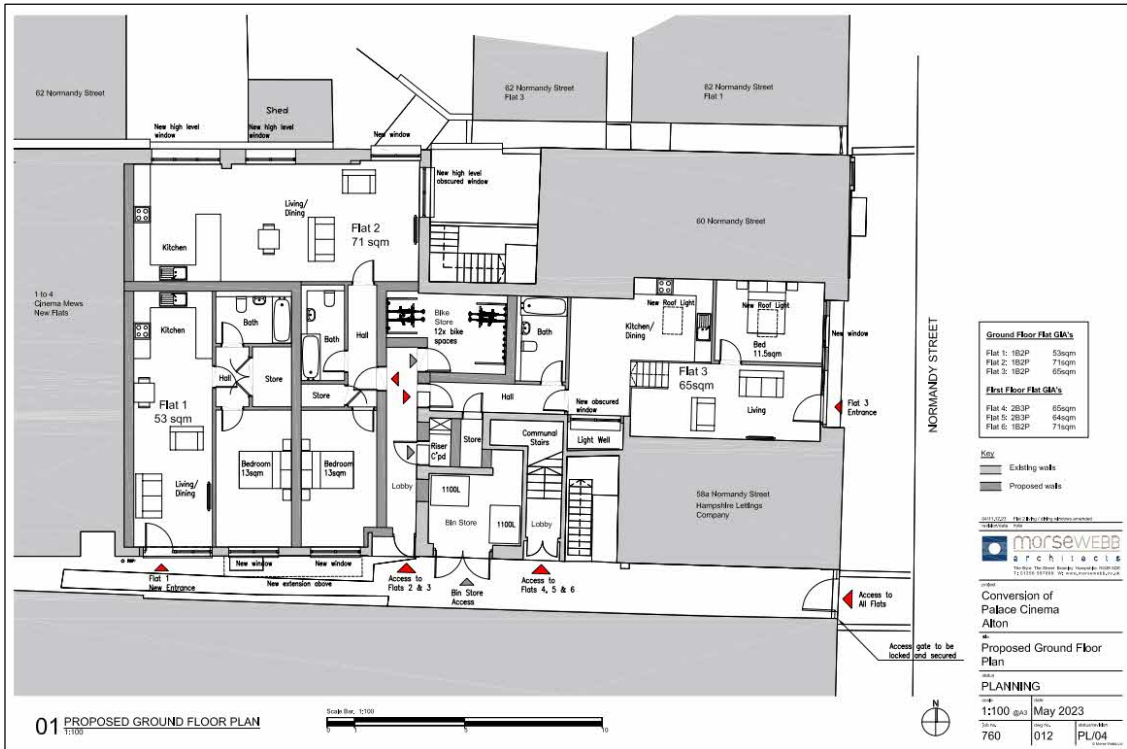


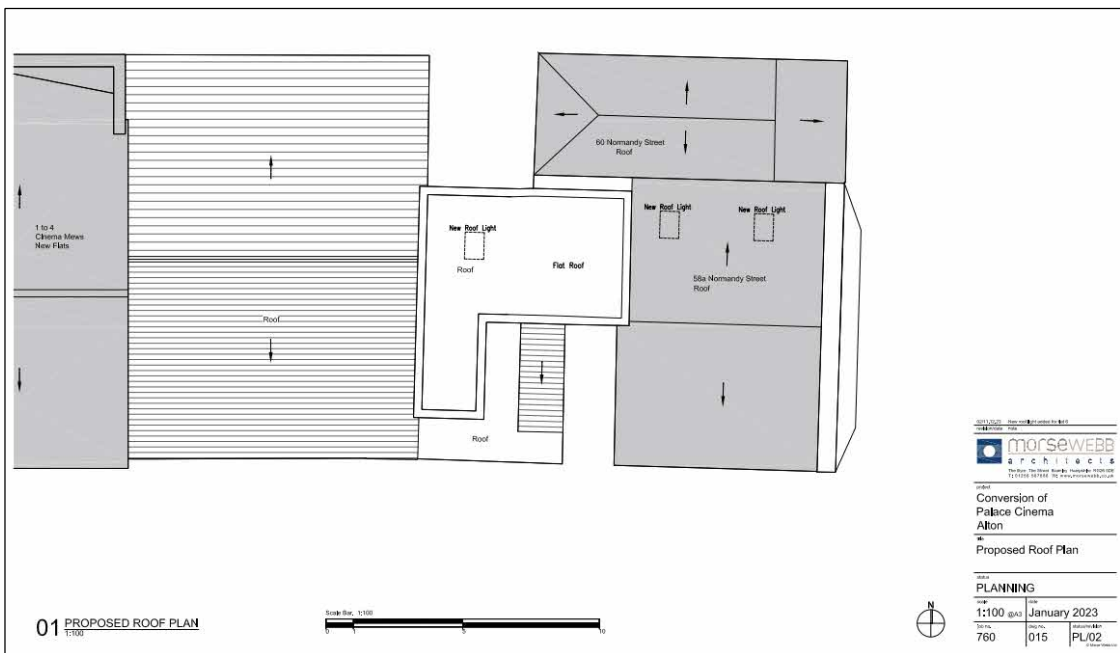
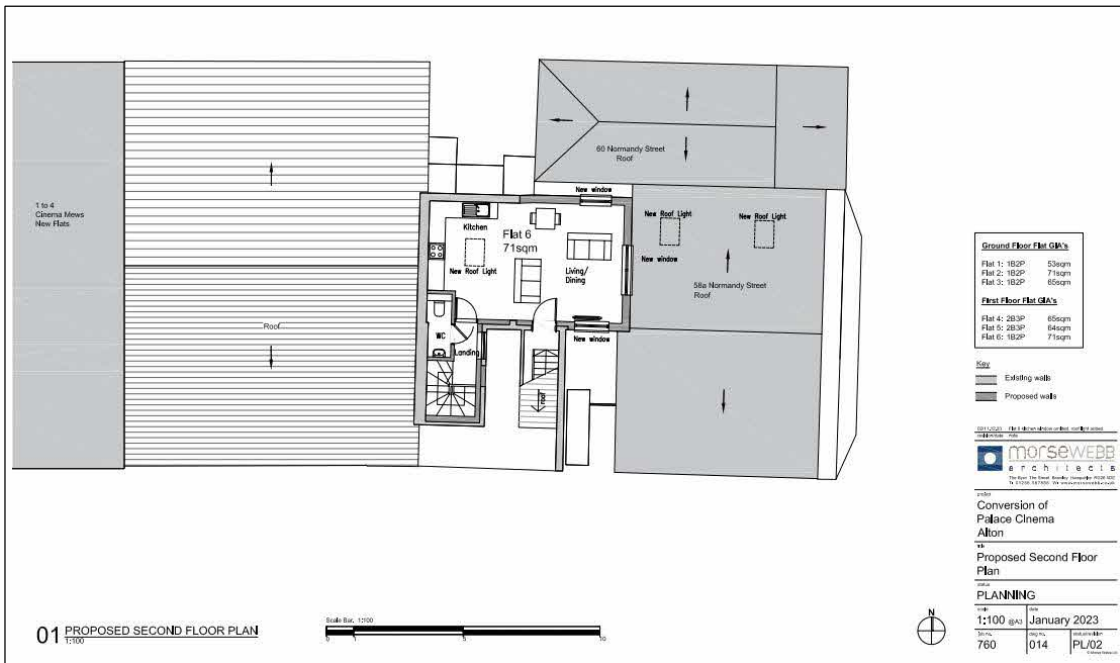
Site Plan showing site boundary (Location & Block Plan - 760-001-PL/01 © Morsewebb Architects January 2023)

5.0 Proposed Development

The proposed development is the conversion of the existing building, with no changes to the external structure other than a new rendered roof extension over the existing terrace and new openings for windows and doors for the proposed flats on the sides of the building. We also understand that no additional building services are proposed.

The proposed site is shown in the following plans.





Plans showing Project Proposals © Morsewebb Architects January 2023.



6.0 Planning Policies, Standards & Guidance

6.1 Policies & Guides

In order to provide a suitable assessment a number of national planning policies have been considered, including:

The National Planning Policy Framework (NPPF), 2023

The Noise Policy Statement for England (NPSE), 2010

Planning Practice Guidance – Noise (PPGN), 2019

The above documents highlight the importance of considering the potential noise effects on any new residential development and provide a qualitative approach to assessment. However, each of the above does not provide any quantitative guidance. As such, all quantitative guidance used to form a noise impact assessment is taken from various other standards, guidance, and Local Authority requirements as summarised below:

Local Authority Guidance – (Housing Health and Safety Rating System – May 2006)

World Health Organisation: 2018

British Standard BS8233: 2014

ProPG : Planning & Noise: 2017

Building Regulations Approved Document O: 2021

British Standard 4142:2014 + A1:2019

Detailed information for relevant planning policies and guidance can be found within Appendix B.

6.2 Specific Local Authority Criteria

We have been provided with a Memorandum from Environmental Health, Ref CONS/108740/23 which states,

“.....To enable this department to make an informed comment, the applicant is requested to provide further information assessing the noise impact of the external noise sources on the proposed residential accommodation. The report should include, if appropriate, measures to be taken to mitigate excess noise impact.

The report shall be prepared by a person with appropriate acoustic qualifications and shall be with full regard to all relevant guidance including CRTN 1988, BS4142:2014 “Methods for rating and assessing industrial and commercial sound”, BS8233:2014 ‘Guidance on Sound Insulation and Noise Reduction for Buildings’, WHO ‘Guidelines for community noise, 1999’ and Pro PG 2017 ‘Planning and Noise: New Residential Development’.

Reason: To protect the amenity of residents”



In addition to the above, regarding noise levels within residential dwellings, East Hampshire District Council makes reference to the 'Housing Health and Safety Rating System – May 2006' issued by the Department for Communities and Local Government.

The following is taken from 'Section B – Psychological Requirements'.

"14 - NOISE

This includes threats to physical and mental health from exposure to noise in the home caused by a lack of sufficient sound insulation. It does not cover unreasonable noisy behaviour of neighbours (domestic or commercial).

Health effects

Figures show that a significant number of people have problems with noise from road traffic/neighbours/people outside. Men tend to react with outwardly directed aggression/annoyance/aggravation/bitterness/anger etc. Women tend to suppress their reactions saying they are tense/fraught/anxious. It appears that night-time traffic noise is more dangerous to health than day-time noise exposure.

Noise can affect both physical and mental health. Physical health effects include raised blood pressure and headaches. Mental health effects include stress/sleep disturbance, lack of concentration/anxiety. In extreme cases, victims can be driven to suicide and assault due to aggravation.

Causes

- *Noise tolerance may in part be determined by age/sex/working status/lifestyle/personality; and*
- *Noise levels can be measured, but people differ in what sources they find offensive.*

Tolerable

- *Neighbours in daytime, some traffic noise or routine home deliveries.*

Intolerable

- *Loud, continuous or apparently unnecessary noises which seem to go on*



indefinitely;

- *Seemingly inconsiderate noises, especially at night;*
- *Emotive, frightening noises, shouting or violent rows;*
- *Night time traffic noise;*
- *Location of dwelling in particularly noisy environment;*
- *Inadequate internal insulation;*
- *Inadequate levels of external sound insulation;*
- *Disrepair of windows/internal/external doors allowing increased noise penetration;*
- *Inappropriate siting of plumbing/fittings/facilities;*
- *Noisy equipment or facilities; and*
- *Overly strong door closers resulting in banging.*

Preventive measures that can affect likelihood and harm outcomes

- *Double/secondary glazing and lobbies to external doors where there are high outside noise levels (e.g. traffic);*
- *Possible triple glazing near airports/sources of very high noise levels;*
- *Insulation of upper floor/ceiling/roof space where aircraft noise is likely;*
- *Plumbing from WCs/cisterns sited away from separating walls;*
- *Bathrooms/WCs in flats not sited above living rooms/bedrooms; and*
- *Better construction/conversions of partitions and party walls especially in flats/maisonettes.*

Hazard assessment (with noise meters if possible)

- *Overlap of domestic noise between one dwelling and another (e.g. toilet flushing/television/conversation etc.) will be assessed for poor sound insulation;*
and
- *Traffic/other external noise also considered.*

Although no specific criteria are outlined within this guidance, the necessity for appropriate levels of sound insulation performance of the building envelope and careful consideration of noise sources such as road traffic, particularly at night time are identified and as per the Memorandum issued by Environmental Health, and we would take the guidance within the stated documents to be a suitable approach to assessing suitability of predicted internal noise levels.



7.0 Baseline Noise Survey

7.1 Procedure

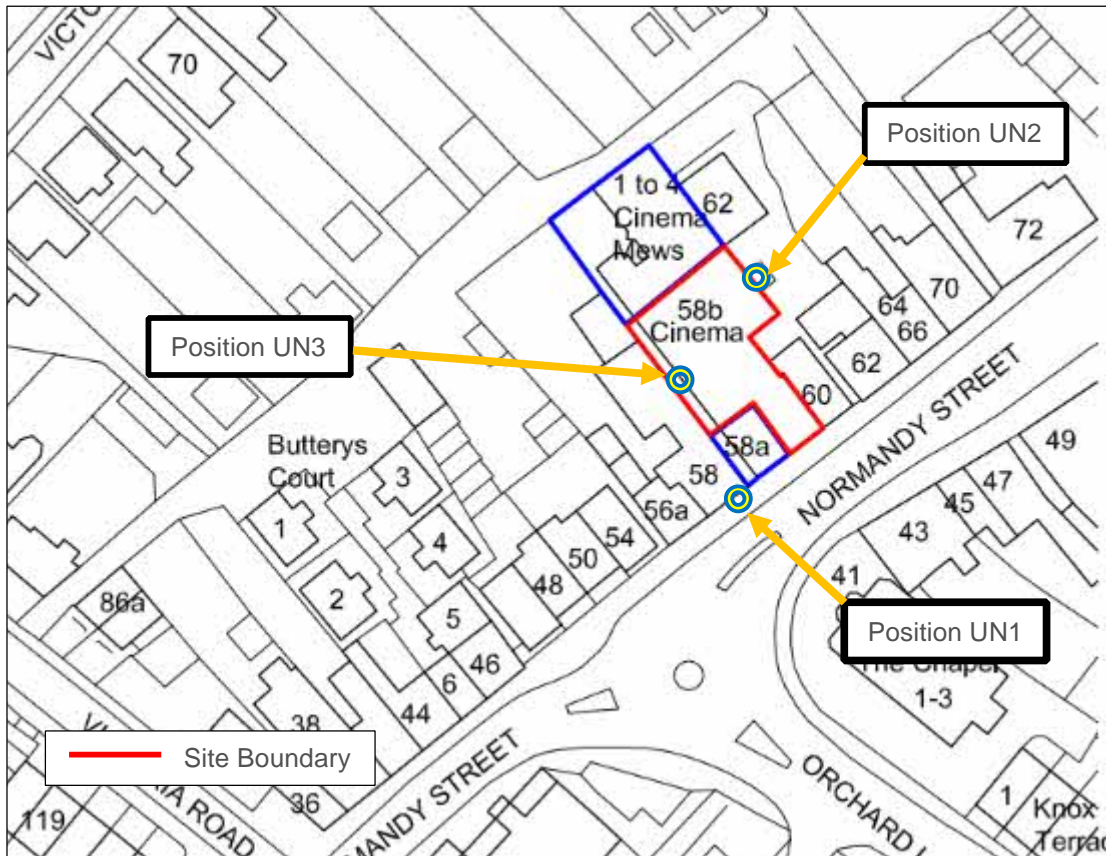
Fully automated environmental noise monitoring was undertaken by Kelvin Carray, BSc AMIOA from approximately 08:00 hours on 12 January 2024 to 08:00 hours on 16 January 2024 to establish full daytime and night-time noise levels over a typical weekday and weekend period. Measurements were taken continuously of the A-weighted (dBA) L_{90} , L_{eq} , and L_{max} sound pressure levels over discrete 2 and 15-minute periods.

7.2 Measurement Positions

The noise level measurements were undertaken at 3No.positions as described in the following table.

Position	Type	Description
UN1	Unattended	<p>The sound level meter was installed inside a small security box with the microphone protruding approximately 6cm out of the box. The security box was fixed to a lamp post within 2m of the site on Normandy Street (on the side facing the road) with the microphone at a height of approximately 2.5 above ground level and 0.5m from the façade of the building behind it.</p> <p>In order to minimise the effect of the box, the microphone was orientated vertically downwards such that it was not screened from the road.</p>
UN2	Unattended	<p>The microphone was attached to a pole protruding upwards at a 45 degree angle from the north east façade of the site from a drain pipe. The microphone was at a distance of approximately 0.5m from the building façade and approximately 4m above ground level.</p>
UN3	Unattended	<p>The microphone was attached to a pole protruding upwards diagonally from the south west façade of the site from a pipe. The microphone was at a distance of approximately 0.5m from the building façade and approximately 4m above ground level</p>

The measurement positions are shown on the following site plan.



Site Plan showing site boundary and Measurement Positions (Location & Block Plan - 760-001-PL/01 © Morsewebb Architects January 2023)

7.3 Weather Conditions

For the unattended survey between 12 January 2024 and 16 January 2024, local weather reports indicated no notable periods of prolonged or heavy rainfall, with temperatures ranging from -3 °C (night) to 8 °C (day) and wind speeds less than 5 m/s. During our time on site, skies were largely clear with light cloud cover, wind conditions were calm and from a northerly direction and road surfaces were largely dry.



7.4 Instrumentation

The instrumentation used during the survey is presented in the following table:

Position	Description	Manufacturer	Type	Serial Number	Calibration
UN1	Type 1 Data Logging Sound Level Meter	Larson Davis	824	3803	Calibration on 04/07/2023
	Type 1 ½" Condenser Microphone	Bruel & Kjaer	4189	2470596	Calibration on 04/07/2023
	Preamp	Larson Davis	PRM902	4214	Calibration on 04/07/2023
UN2	Type 1 Data Logging Sound Level Meter	Larson Davis	824	3804	Calibration on 28/11/2023
	Type 1 ½" Condenser Microphone	ACO Pacific	7052E	50282	Calibration on 28/11/2023
	Preamp	Larson Davis	PRM902	1828	Calibration on 28/11/2023
UN3	Type 1 Data Logging Sound Level Meter	Larson Davis	824	3541	Calibration on 03/01/2024
	Type 1 ½" Condenser Microphone	PCB	377B02	107842	Calibration on 03/01/2024
	Preamp	Larson Davis	PRM902	0880	Calibration on 03/01/2024
All Positions	Type 1 Calibrator	Bruel & Kjaer	4230	1411668	Calibration on 27/07/2023

Each sound level meter, including the extension cable, was calibrated prior to and on completion of the surveys. No significant changes were found to have occurred (no more than 0.1dB).

The sound level meter at Position UN1 was located within a small metal box security box as described in Section 7.2.

The sound level meters at Position UN2 and Position UN3 were located in an environmental case with the microphone connected to the sound level meter via an extension cable. Each microphone was fitted with a windshield.



7.5 Results

The results have been plotted on Time History Graphs 31268/NIA1/TH1 to 31268/NIA1/TH3 enclosed presenting the 15-minute A-weighted (dBA) L_{90} , L_{eq} and L_{max} levels at each measurement position throughout the duration of the survey.

In order to compare the results of our survey with the relevant guidelines it is necessary to convert the measured $L_{Aeq(15\text{minute})}$ noise levels into single figure daytime $L_{Aeq(16\text{-hour})}$ (07:00-23:00 hours) and night-time $L_{Aeq(8\text{-hour})}$ (23:00-07:00 hours) levels.

A summary of the results, as used to inform subsequent assessments against current guidelines, is presented in the table below. The L_{A90} values presented are the modal levels determined through statistical analysis of the 15-minute readings. L_{Amax} values are the '10th highest' 2-minute value in line with Approved Document O (Part O) requirements.

Position	Day/Period	Daytime (07:00 – 23:00 hrs)		Night-time (23:00 – 07:00 hrs)		
		$L_{Aeq,16hr}$	L_{A90}	$L_{Aeq,8hr}$	L_{A90}	L_{Amax}
UN1	12/01/2024	71*	67*	63	32	85
	13/01/2024	72	66	61	32	81
	14/01/2024	70	65	64	32	85
	15/01/2024	73	66	65	32	84
UN2	12/01/2024	55*	53*	43	35	63
	13/01/2024	53	45	42	35	62
	14/01/2024	51	40	44	35	64
	15/01/2024	54	47	45	35	63
UN3	12/01/2024	-	-	44	28	68
	13/01/2024	53	47	43	29	65
	14/01/2024	52	47	45	30	67
	15/01/2024	53	48	45	29	66

*Indicates incomplete period

The above levels are as measured at the measurement positions and include local reflections.



7.6 Discussion of Noise Climate

Due to the nature of the survey, i.e. unattended, it is not possible to accurately describe the dominant noise sources, or specific noise events throughout the entire survey period. However, at the beginning and end of the survey period the noise climate was noted to be dominated by road traffic noise from Normandy Street in particular at Position UN1 and UN3, and with more notable contribution from distant road traffic noise at Position UN2.

Although not active during our engineers time on site, at Position UN2, the results indicate a contribution from another source from 14:30 hours until approximately 20:30 hours on Friday, Saturday and Monday night. This is likely to be from nearby plant.

Based on its location relative to the site and its listed opening hours, this is likely to be from the kitchen extract fan of the nearby Campbell's Fish and Chip Shop, at a distance of approximately 20m from the measurement position.

8.0 Existing Industrial Noise Impacts

8.1 Overview

This section considers the potential noise impact of the existing adjacent commercial premises and associated activities on proposed residential receptors. The assessment follows methodology set out within BS 4142:2014.

Our assessment has been carried out to 1 m from the worst affected window of the proposed development and is based on the chip shop extract fan when measured at the facade of the proposed new dwellings (Position UN2).

From their website, the chip shop opening hours are 16:00 hours to 21:00 hours. As stated above, we measured the commercial activity from approximately 14:30 hours to 20:30 hours on Friday, Saturday and Monday.



Based on the measured data and observations made on site, the table below provides an initial BS4142:2014 assessment.

Results		Relevant Clause	Commentary
Measured Ambient Level L_a	54 dB L_{Aeq}	7.3.2	Specific sound source on, i.e. assumed chip shop extract fan operating.
Measured Residual Level L_r	53 dB L_{Aeq}	7.3.3	Representative level during times the chip shop was closed and extract fan was not operating.
Assessment made during the daytime so reference period is 1 hour		7.2	
Specific Sound Level, $L_{Aeq,Tr}$	54 dB L_{Aeq}	7.3.8 7.3.9 7.3.10	Specific level of source (as measured at receptor so no requirement to correct for residual level or on-time)
Acoustic feature correction	0	9.2	Once operational, the fan is steady, and does not appear to be tonal or impulsive.
Rating level $L_{Ar,Tr}$	54 dB $L_{Ar,Tr}$	9.2	Calculated by adding acoustic feature corrections to the specific sound level.
Background sound level $L_{A90,T}$	46 dB L_{A90}	8.1.1 8.1.3 8.3	Typical background sound level measured at the proposed development site during the daytime, just before the chip shop started operating.
Background sound level L_{Aeq}	53 dB L_{Aeq}	-	This is a deviation from BS 4142 but intended to show the small variance in L_{Aeq} noise levels.
Excess of rating over background sound level	8 dB	11	
Assessment indicates likelihood of an adverse impact to residents without noise mitigation measures.		11	The excess of the rating level over the background level is very high, mitigation measures must therefore be assessed further to ensure good internal acoustic conditions. The context is that this has operated for many years in a residential area. It only runs during daytime hours and only during the late afternoon / evenings. Attention is also drawn to the small (1dB) difference between ambient and background L_{Aeq} noise levels.
Uncertainty of the assessment	Low	10	The background sound level is based on repeatable measurements made over the duration of a number of days. The measurements of noise from the plant remained consistent throughout reference period, when operational.

The above indicates a likelihood of an adverse impact to proposed residents without noise mitigation measures, however, the context of the site must be considered to enable a full assessment.

Where the initial estimate of the impact needs to be modified due to the context, BS 4142:2014



states that all pertinent factors should be taken into consideration, including the following:

- The sensitivity of the receptor and whether dwellings will already incorporate design measures that secure good internal acoustic conditions.

Clearly, therefore, an initial estimate of an adverse impact does not imply that development may not be permitted, provided that proposed dwellings can incorporate design measures (ie imbedded mitigation) that secure good internal acoustic conditions.

In light of the above, we recommend that appropriate mitigation measures are incorporated into the design of proposed dwellings to control noise from the proposed facilities to a suitable level.

9.0 Achieving Internal Noise Levels

There are 2No ventilation conditions applicable to proposed residential dwellings. These are Background Ventilation as described in Approved Document F (Part F) and Purge Ventilation (odour and smells).

9.1 Purge Ventilation

It should be noted that the internal noise level guidelines are generally not applicable under “purge ventilation” conditions as defined by Part F, as this should only occur occasionally (e.g. to remove odour from painting and decorating or from burnt food).

As such, acoustic conditions are generally not a concern during purge ventilation.

9.2 Background Ventilation Condition

9.2.1 Criteria

With reference to the acoustic standards and guidelines as reviewed in Appendix B, the external noise intrusion levels from environmental sources should be controlled so as to not exceed the following criteria.

Activity	Location	Desirable Internal Ambient Criteria	
		07:00 – 23:00	23:00 – 07:00
Resting	Living Rooms	35 dB LAeq,16hour	-
Dining	Dining Room/Area	40 dB LAeq,16hour	-
Sleeping (Daytime Resting)	Bedroom	35 dB LAeq,16hour	30 dB LAeq,8hour 45 dB ^[1] LAmax

[1] regular noise events such as trains, aircraft (10th highest)



Note 1: For this site the LAeq,T noise parameter alone is not considered to be sufficient given the character of the noise climate we have measured as there are significant night-time noise events for which the night time Lmax regularly exceeds a level 15dB higher than night-time LAeq,8 hours. This is consistent with Section 2.2.2 of The World Health Organisation Environmental Noise Guidelines for the European Region and Note 4 of Section 7.7.2 of BS8233:2014

Note 2: Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target noise levels may be relaxed (subject to the requirements of any planning conditions) by up to 5 dB and reasonable internal conditions still achieved.

Section 8.0 considers existing industrial use impacts in line with BS 4142 and advises that adverse impacts on future occupants could be avoided with suitably specified façade elements to secure suitable internal noise levels. Where existing industrial/commercial noise could 'contribute' to incident external noise levels on a given façade but do not 'dominate', the BS8233 internal noise level targets should be met. However, where the industrial noise has the potential to dominate the external noise climate, that industrial noise intrusion should achieve limits 5 dB lower than the BS8233 levels.

9.2.2 Outline Specifications

Based on the prevailing noise climate at the site, open windows as a means of background ventilation would not be suitable on any façade across the development. As such, alternative ventilation measures would be required.

Allowance should be made to provide appropriate sound insulation solutions as required including, where necessary, suitably specified glazing (and doors) and attenuated ventilators/mechanical ventilation systems. Preliminary calculations have been carried out to determine the likely façade sound insulation performance requirements for each façade. Calculation methods follow those outlined in BS 8233:2014 Section G.2 and are based on the following:

Conventional brick external wall/ with plaster/rendering assumed for existing external wall and cavity masonry to be used for proposed walls on the south east elevation facing Normandy Street.

Typical room volume as per latest drawings.

Typical window areas as per latest drawings.

Reverberation time of 0.5 seconds.

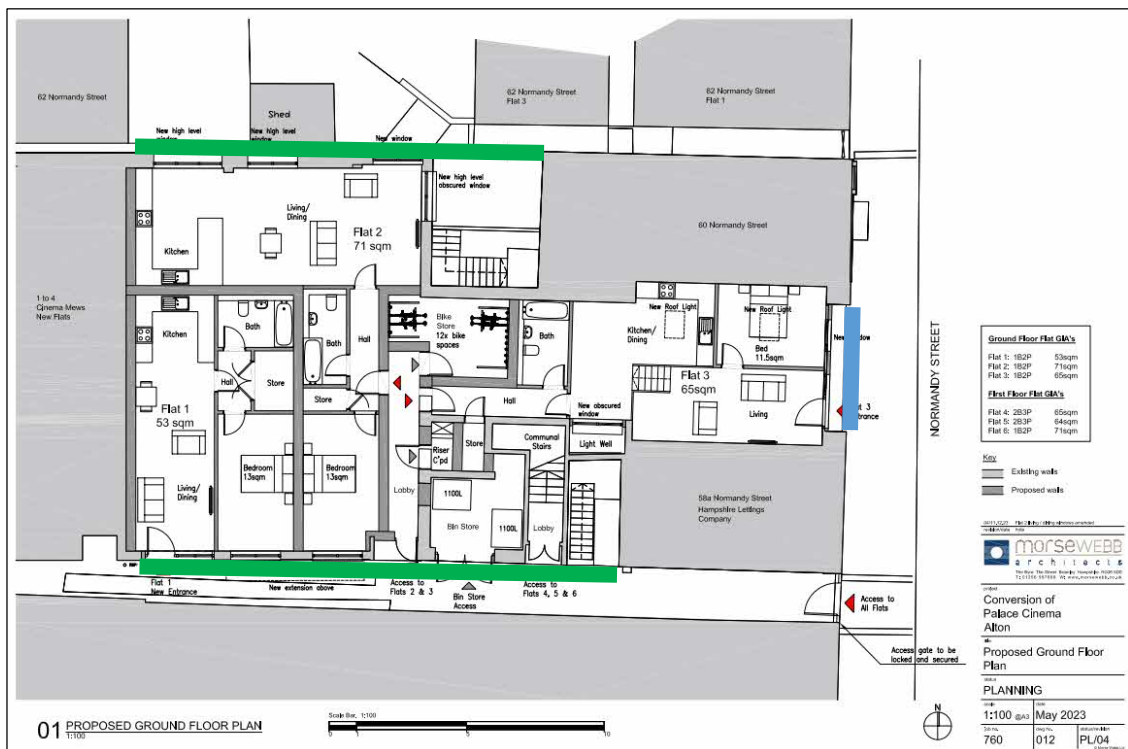


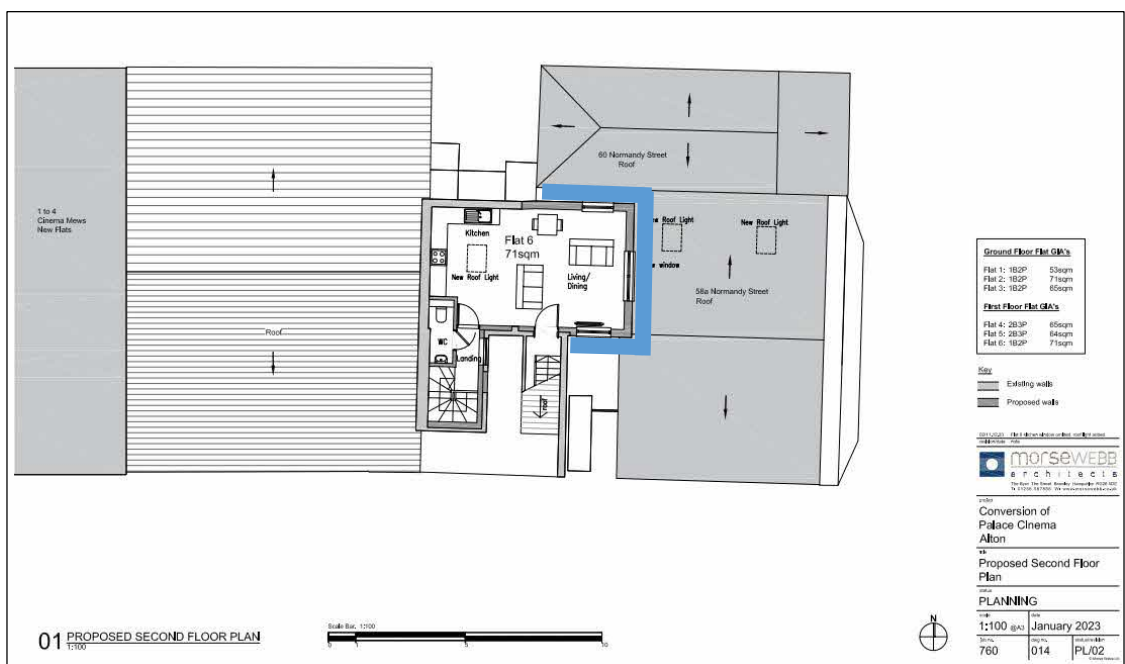
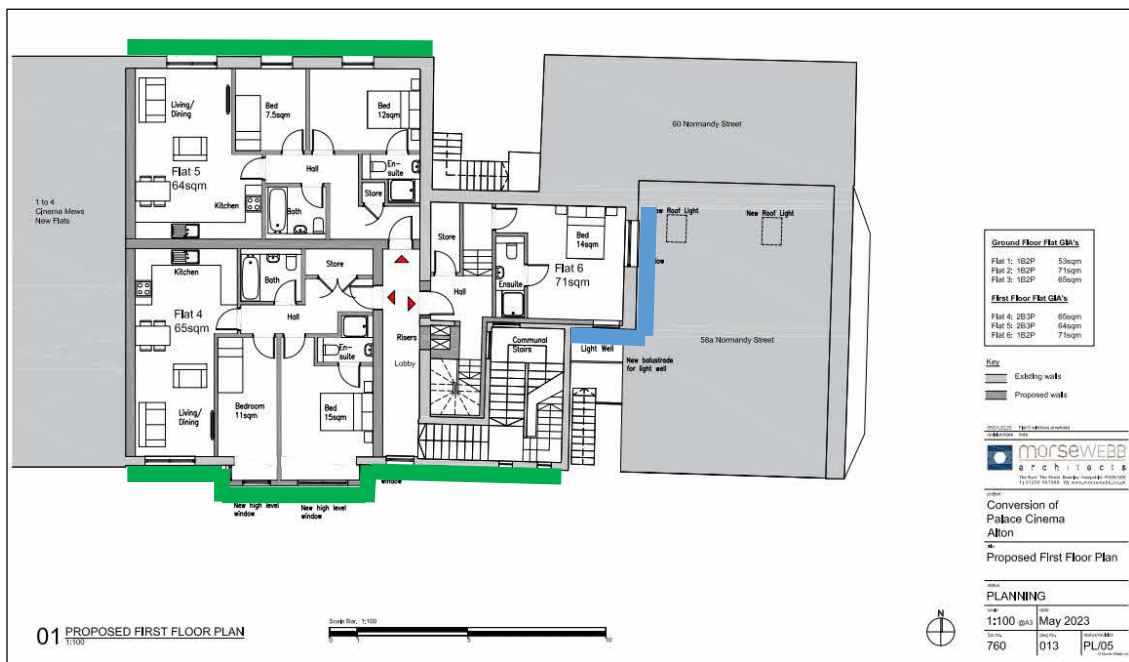
From the results of the assessment, the following minimum preliminary acoustic performance specifications are recommended. These are intended for planning use only, and detailed design stage octave band acoustic specifications will need to be developed for tender.

We also suggest that 3D noise modelling will be carried out at detailed design stage in order to determine incident noise levels on all façades, for each level of the development which may result in additional, less onerous specifications being suitable for façades which benefit from screening from key noise sources around the site.

Façade Zone		Façade Element	Preliminary Minimum Sound Reduction Specification
A	Blue	Windows and External Doors	40 dB $R_w + C_{tr}$
		Ventilator	44 $D_{new} + C_{tr}$
B	Green	Windows and External Doors	27 dB $R_w + C_{tr}$
		Ventilator	33 $D_{new} + C_{tr}$

The following plans show the location of each façade zone noted in the table above.





Plans showing Project Proposals © Marsewebb Architects January 2023.



9.2.3 Example Glazing Configurations

Example glazing configurations commensurate with achieving the sound insulation specifications noted in Section 9.2.2 are given below.

Glazing Specification, $R_w + C_{tr}$ (dB)	Example Configuration
40	Acoustic double glazed system e.g. 10/20/8.8 mm
27	Double glazed system e.g 6/16/6 mm.

9.2.4 Example Ventilation Solutions

Example ventilation solutions commensurate with achieving the elemental sound insulation performances noted in Section 9.2.2 are discussed below.

Ventilator Specification, $D_{new} + C_{tr}$ (dB)	Example Configuration
44	Acoustic trickle vent per habitable room.
33	1 x 2,500mm ² standard hit-miss trickle vent per habitable room.

The preliminary performance specifications included above are based on the provision of 1no. ventilator only per habitable room as required. If additional numbers of ventilators are required to achieve the ventilation rates, the performance requirement for the individual ventilators will need to increase.

The table below provides guidance on the increase in performance specification required for additional numbers of ventilators.

Number of Ventilators	Performance Increase on Ventilator Specifications Stated Above
1	+0 dB
2	+3 dB
3	+5 dB
4	+6 dB

10.0 Conclusions

A detailed environmental noise survey has been undertaken in order to establish the currently prevailing environmental noise climate around the site.

The environmental noise impact upon the proposed dwellings has been assessed in the context of building regulations, and national and local planning policies.



Appropriate target internal noise levels have been proposed. These are achievable using conventional mitigation measures.

Preliminary acoustic performance specifications for the external building fabric elements have been recommended such that appropriate internal noise levels should be achieved. These are intended for planning use only, and detailed design stage octave band acoustic specifications will need to be developed for tender.

We also suggest that 3D noise modelling will be carried out at detailed design stage in order to determine incident noise levels on all façades, for each level of the development which may result in additional, less onerous specifications being suitable for façades which benefit from screening from key noise sources around the site.

The assessment shows the site, subject to appropriate mitigation measures, is suitable for residential development in terms of noise.

Appendix A

Acoustic Terminology

The acoustic terms used in this report are defined as follows:

dB	Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form. The relationships between Decibel levels do not work in the same way that non-logarithmic (linear) numbers work (e.g. 30dB + 30dB = 33dB, not 60dB).
dBA	<p>The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The 'A'-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The _A subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted</p> <p>It should be noted that levels in dBA do not have a linear relationship to each other; for similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is just perceptible.</p>
L _{90,T}	L ₉₀ is the noise level exceeded for 90% of the period <i>T</i> (i.e. the quietest 10% of the measurement) and is often used to describe the background noise level.
L _{eq,T}	L _{eq,T} is the equivalent continuous sound pressure level. It is an average of the total sound energy measured over a specified time period, <i>T</i> .
L _{max}	L _{max} is the maximum sound pressure level recorded over the period stated. L _{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L _{eq} noise level.
L _p	Sound Pressure Level (SPL) is the sound pressure relative to a standard reference pressure of 2 x 10 ⁻⁵ Pa. This level varies for a given source according to a number of factors (including but not limited to: distance from the source; positioning; screening and meteorological effects).
L _w	Sound Power Level (SWL) is the total amount of sound energy inherent in a particular sound source, independent of its environment. It is a logarithmic measure of the sound power in comparison to a specified reference level (usually 10 ⁻¹² W).

Appendix B

Planning Policies, Standards & Guidance

B.1 Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) was published in March 2010 (i.e. before the NPPF). The NPSE is the overarching statement of noise policy for England and applies to all forms of noise other than occupational noise, setting out the long term vision of Government noise policy which 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.”

That vision is supported by the following NPSE noise policy aims which are reflected in three of the four aims of planning policies and decisions in paragraph 123 of the NPPF (see paragraph 8.2 (b) below):

“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.”*

The Explanatory Note to the NPSE has three concepts for the assessment of noise in this country:

NOEL – No Observed Effect Level

This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.

LOAEL – Lowest Observable 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.

None of these three levels are defined numerically and for the SOAEL the NPSE makes it clear that the noise level is likely to vary depending upon the noise source, the receptor and the time of day/day of the week, etc. The need for more research to investigate what may represent an SOAEL for noise is acknowledged in the NPSE and the NPSE asserts that not stating specific SOAEL levels provides policy flexibility in the period until there is further evidence and guidance.

The NPSE concludes by explaining in a little more detail how the LOAEL and SOAEL relate to the three NPSE noise policy aims listed above. It starts with the aim of avoiding significant adverse effects on health and quality of life, then addresses the situation where the noise impact falls between the LOAEL and the SOAEL when *“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.”* The final aim envisages pro-active management of noise to improve health and quality of life, again taking into account the guiding principles of sustainable development which include the need to minimise travel distance between housing and employment uses in an area.

B.2 National Planning Policy Framework (NPPF)

The following paragraphs are from the NPPF (published December 2023):

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

- a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and
- c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

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

Paragraph 185 also references the Noise Policy Statement for England (NPSE). This document does not refer to specific noise levels but instead sets out three aims:

- “Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.
- Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.”

B.3 Planning Practice Guidance on Noise

Planning Practice Guidance (PPG) under the NPPF has been published by the Government as a web based resource at <http://planningguidance.planningportal.gov.uk/blog/guidance/>. This includes specific guidance on Noise although, like the NPPF and NPSE the PPG does not provide any quantitative advice. It seeks to illustrate a range of effect levels in terms of examples of outcomes as set out in the following table:

Perception	Examples of Outcomes	Increasing effect level	Action
Not noticeable	No effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	

Perception	Examples of Outcomes	Increasing effect level	Action
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, 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.	Observed Adverse Effect	Mitigate and reduce to a minimum
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, 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
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable hard, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

B.4 World Health Organisation

The current Environmental Noise Guidelines 2018 for the European Region (ENG) supersede the Guidelines for Community Noise from 1999 (CNG). Nevertheless, the ENG recommends that all CNG indoor guideline values and any values not covered by the current guidelines (such as industrial noise and shopping areas) remain valid.

A summary of the guidance from the ENG and CNG is shown in the table below.

Source	CNG guideline indoors all sources	ENG guideline outdoors noise from specific source only
Road traffic noise	35 $L_{Aeq, 16h}$	53 dB L_{den}
	30 $L_{Aeq, 8h}$	45 dB L_{night}
Railway noise	35 $L_{Aeq, 16h}$	54 dB L_{den}
	30 $L_{Aeq, 8h}$	44 dB L_{night}
Aircraft noise	35 $L_{Aeq, 16h}$	45 dB L_{den}
	30 $L_{Aeq, 8h}$	40 dB L_{night}

With regard to single-event noise indicators, Section 2.2.2 of the WHO Environmental Noise Guidelines 2018 state:

“In many situations, average noise levels like the L_{den} or L_{night} indicators may not be the best to

explain a particular noise effect. Single-event noise indicators – such as the maximum sound pressure level ($L_{A,max}$) and its frequency distribution – are warranted in specific situations, such as in the context of night-time railway or aircraft noise events that can clearly elicit awakenings and other physiological reactions that are mostly determined by $L_{A,max}$. Nevertheless, the assessment of the relationship between different types of single-event noise indicators and long-term health outcomes at the population level remains tentative. The guidelines therefore make no recommendations for single-event noise indicators.”

B.5 British Standard BS8233: 2014

British Standard 8233: 2014 “Guidance on sound insulation and noise reduction for buildings” provides guidance for the control of noise in and around buildings.

Internal Areas

BS8233:2014 Section 7.7.2 titled “Internal ambient noise levels for dwellings” states:

“In general for steady external noise sources, it is desirable that internal ambient noise levels do not exceed the following guideline values:

Activity	Location	Desirable Internal Ambient Criteria	
		07:00 – 23:00	23:00 to 07:00
Resting	Living Rooms	35 dB $L_{Aeq,16hour}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq,16hour}$	-
Sleeping (Daytime Resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

Note 1 The above table provides recommended levels for overall noise in the design of a building. These are the sum total of structure-borne and airborne noise sources. Groundborne noise is assessed separately and is not included as part of these targets, as human response to groundborne noise varies with many factors such as level, character, timing, occupant expectation and sensitivity.

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

Note 3 These 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 News Year’s Eve.

Note 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$ depending on the character and

number of events per night. Sporadic noise events could require separate values.

Note 5 If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the façade insulation or the resulting noise level.

If applicable, any room should have adequate ventilation (e.g. trickle ventilators should be open) during assessment.

Note 6 Attention is drawn to the Building Regulations.

Note 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.”

External Amenity Areas

BS8233:2014 Section 7.7.3.2 titled “Design criteria for external noise” states:

“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 $L_{Aeq,T}^1$, 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.

Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens, and terraces, which might be intended to be used for relaxation. In high-noise areas consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55dB $L_{Aeq,T}$ or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space.”

B.6 ProPG : Planning & Noise : 2017

The primary goal of the ProPG is to assist the delivery of sustainable development by promoting good health and well-being through the effective management of noise. It seeks to do that through encouraging a good acoustic design process in and around proposed new residential development having regard to national policy on planning and noise. It is applicable to noise

from existing transport sources (noting that good professional practice should have regard to any reasonably foreseeable changes in existing and/or new sources of noise). The recommended approach is also considered suitable where some industrial or commercial noise contributes to the acoustic environment provided that is “not dominant”.

This ProPG advocates a systematic, proportionate, risk based, 2-stage, approach. The approach encourages early consideration of noise issues, facilitates straightforward accelerated decision making for lower risk sites, and assists proper consideration of noise issues where the acoustic environment is challenging.

The two sequential stages of the overall approach are:

Stage 1 – an initial noise risk assessment of the proposed development site;
and

Stage 2 – a systematic consideration of four key elements.

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”; and

Element 4 – consideration of “Other Relevant Issues”.

The ProPG considers suitable guidance on internal noise levels found in “BS8233:2014: Guidance on sound insulation and noise reduction for buildings”. Table 4 in Section 7.7.2 of the standard suggests that “in general, for steady external noise sources, it is desirable that the internal ambient noise level does not exceed the guideline values”. The standard states (Section 7.7.1) that “occupants are usually more tolerant of noise without a specific character” and only noise without such character is considered in Table 4 of the standard.

Activity	Location	07:00 – 23:00 Hours	23:00 – 07:00 Hours
Resting	Living Room	35dB $L_{Aeq,16hr}$	-
Dining	Dining Room / Area	40dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35dB $L_{Aeq,16hr}$	30dB $L_{Aeq,16hr}$ 45dB $L_{Amax,F}$

NOTE 1 the Table provides recommended internal L_{Aeq} target levels for overall noise in the design of a building. These are the sum total of structure-borne and airborne noise sources.

Ground-borne noise is assessed separately and is not included as part of these targets, as human response to ground-borne noise varies with many factors such as level, character, timing, occupant expectation and sensitivity.

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

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

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

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

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

NOTE 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal L_{Aeq} target levels may be relaxed by up to 5dB and reasonable internal conditions still achieved. The more often internal L_{Aeq} levels start to exceed the internal L_{Aeq} target levels by more than 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 10dB, they are 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 (See Section 3.D).

B.7 Building Regulations Approved Document O

Building Regulations Approved Document O relates to setting standards for overheating in new residential buildings. It aims to protect the health and welfare of occupants of the building by reducing the occurrence of high indoor temperatures.

Requirement O1 of Approved Document O is met by designing and constructing the building to achieve both of the following:

- a. Limiting unwanted solar gains in summer.
- b. Providing an adequate means of removing excess heat from the indoor environment.

Sections 3.2 to 3.4 of this document relate to noise and state the following:

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

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

- a. 40dB $L_{Aeq,T}$, averaged over 8 hours (between 11pm and 7am).
- b. 55dB L_{AFmax} , more than 10 times a night (between 11pm and 7am).

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

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

B.8 British Standard 4142:2014 + A1:2019

When setting plant noise emission criteria reference is commonly made to BS 4142:2014 “*Methods for rating and assessing industrial and commercial sound*”.

The procedure contained in BS 4142:2014 provides an assessment of the likely effects of sound on people when comparing the specific noise levels from the source with representative background noise levels. Where the noise contains “a tone, impulse or other characteristic” then various corrections can be added to the specific (source) noise level to obtain the “rating level”.

BS 4142 states that: “*The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs*”. An estimation of the impact of the specific noise can be obtained by the difference of the rating noise level and the background noise level and considering the following:

- “*Typically, the greater this difference, the greater the magnitude of the impact.*”
- “*A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.*”
- “*A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.*”
- “*The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*”

The determination of the “rating level” and the “background level” are both open to interpretation, depending on the context.

Appendix C

Time History Graphs

58b Normandy Street

Position UN1

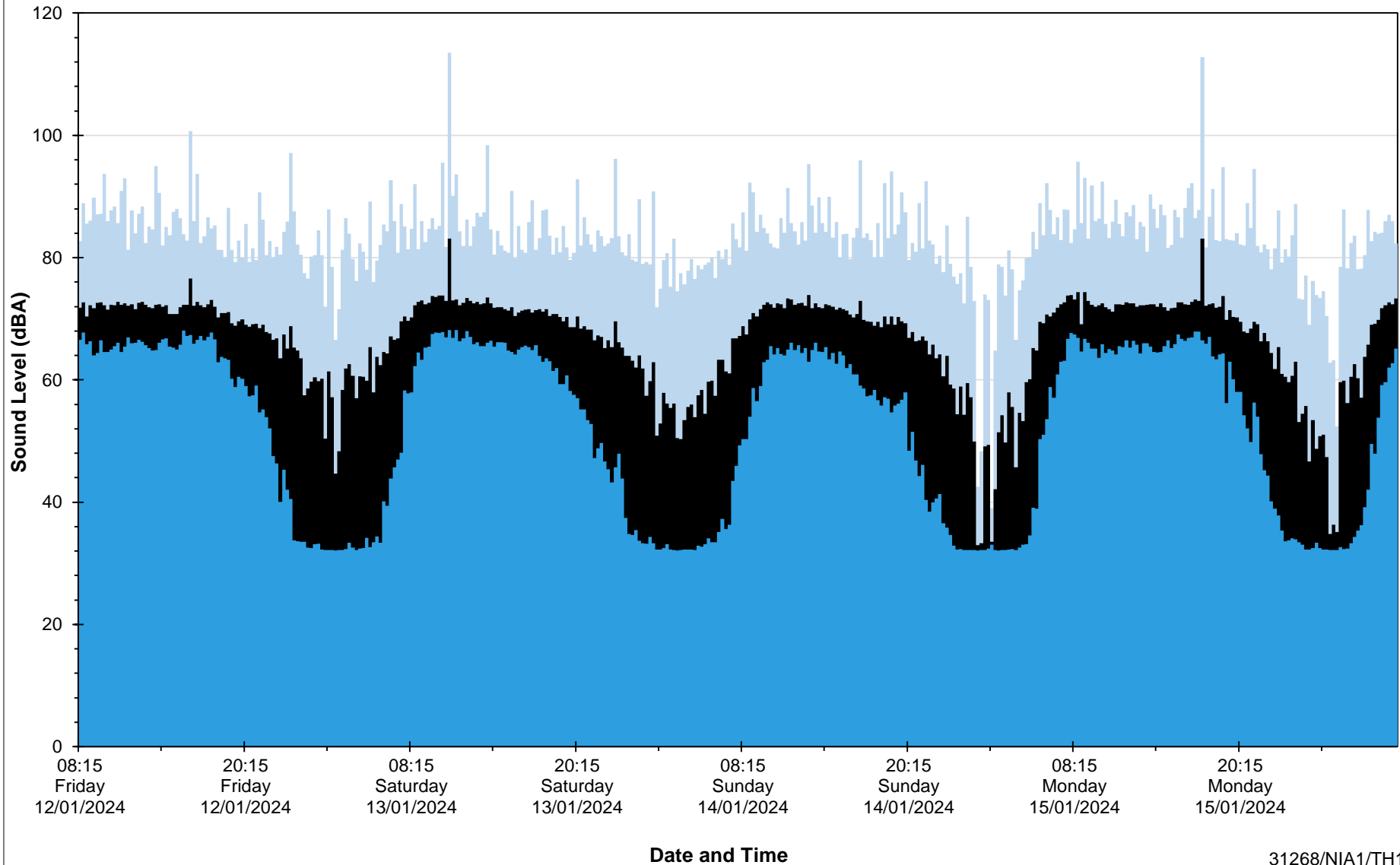
L_{eq} , L_{max} and L_{90} Noise Levels

Friday 12 January 2024 to Tuesday 16 January 2024

■ L_{max}

■ L_{eq}

■ L_{90}



58b Normandy Street

Position UN2

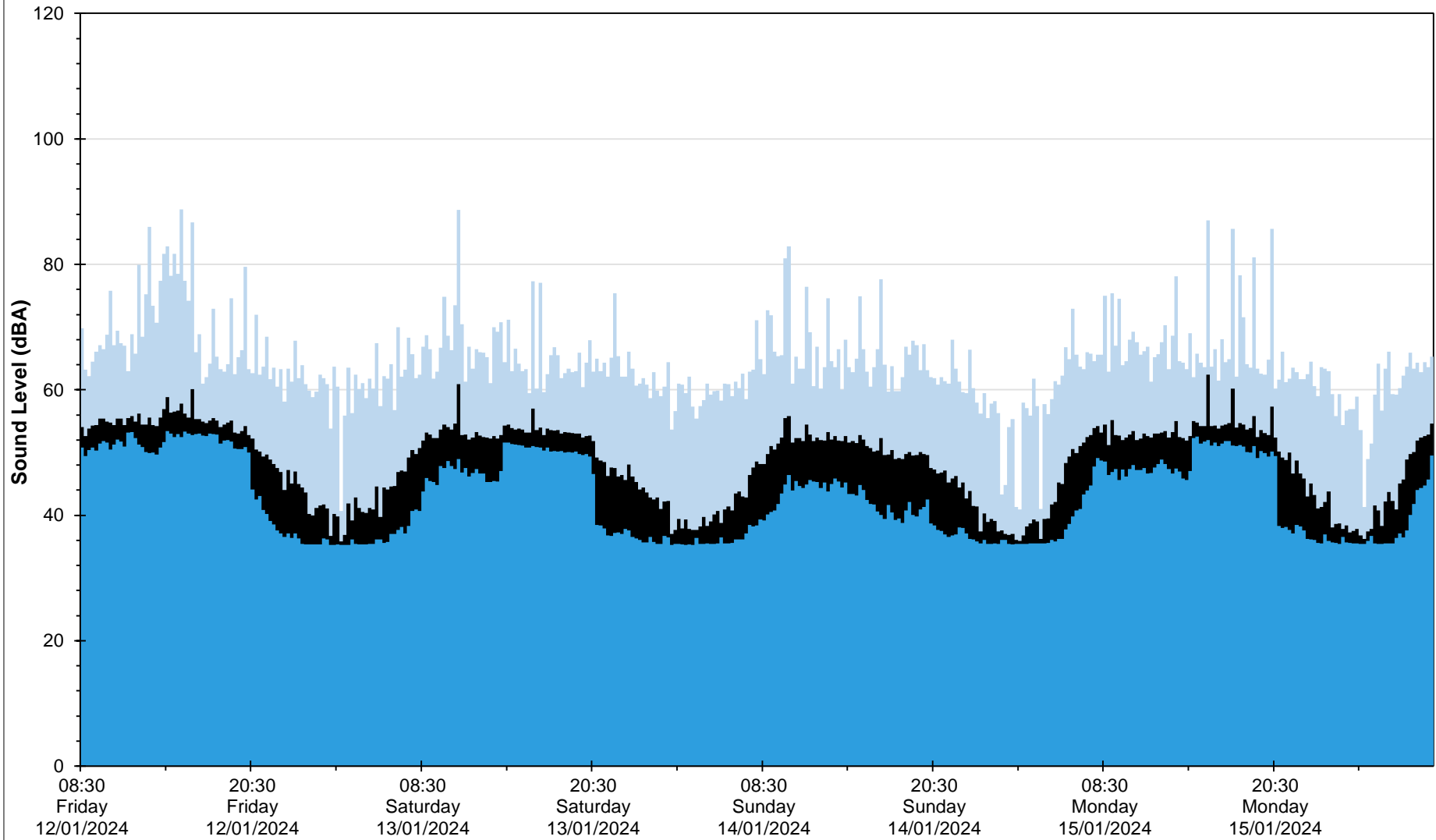
L_{eq} , L_{max} and L_{90} Noise Levels

Friday 12 January 2024 to Tuesday 16 January 2024

■ L_{max}

■ L_{eq}

■ L_{90}



Date and Time

31268/NIA1/TH2

58b Normandy Street

Position UN3

L_{eq} , L_{max} and L_{90} Noise Levels

Friday 12 January 2024 to Tuesday 16 January 2024

■ L_{max}

■ L_{eq}

■ L_{90}

