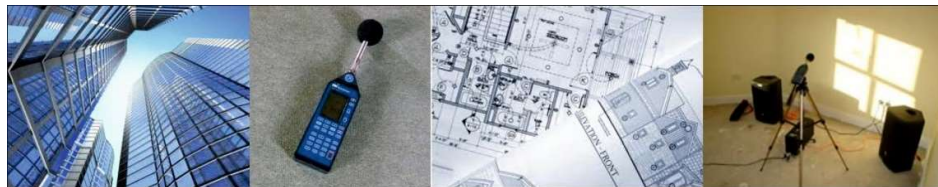


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**33 – 34 VICTORIA ROAD
NETLEY
SOUTHAMPTON
SO31 5DG**

ENVIRONMENTAL NOISE ASSESSMENT
CONDITION 3 OF APPLICATION F/24/96741 & F/23/96241
v.2

Client:
AZUREUS HOMES LIMITED

5 July 2024
Ref: M5618

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Project Reference	M5614
Issue No.	2
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1. SUMMARY

- 1.1 An assessment of environmental noise has been undertaken at a proposed residential development at 33 – 34 Victoria Road, Netley.
- 1.2 It is proposed to convert the building to create two new flats at the rear of the ground floor, and two further flats on the first floor.
- 1.3 The existing ambient noise climate affecting the site has been established by means of a 96-hour environmental noise survey (Section 3). The survey data has been used to confirm the daytime and night-time noise levels affecting each façade of the building.
- 1.4 Section 4 provides a description of the relevant national planning policies and defines the criteria which would commonly be applied to projects of this nature.
- 1.5 In order to comply with these requirements, the following replacement Glazing and Ventilation provisions have been recommended:

Frequency	Hz	63	125	250	500	1K	2K	4K	8K	Rw + Ctr	Config
Glazing											
Front Elevation	dB	14	24	28	31	43	39	45	45	30	4 / 20 / 6
Rear Elevation	dB	21	21	18	26	37	42	33	35	27	4 / 16 / 4
Frequency	Hz	63	125	250	500	1K	2K	4K	8K	Dn,e,w	Vent Type
Trickle Vents											
Front Elevation	dB	42	42	38	35	36	42	43	38	38 (Open)	Simons EHAS
Rear Elevation	dB	40	39	35	35	31	32	35	40	32 (Open)	Simons FV

Table 1.1 – Proposed Glazing and Ventilation Types (Sound Insulation Performance, dB)

- 1.6 Section 5 also discusses the acoustic implications of providing higher rates of ventilation. It notes that bedrooms could be ventilated at night using an open-window strategy. During the day, however, all rooms would experience internal noise levels above the AVOG guidelines (themselves derived from BS8233).
- 1.7 It is therefore recommended that day time occupancy is protected by the provision of a mechanical means of pushing fresh air through the apartments (see Section 5).
- 1.8 With these provisions in place, the acoustic amenity of the new occupiers can be assured.

2. INTRODUCTION

- 2.1 An assessment of environmental noise has been undertaken at 33 – 34 Victoria Road, Netley, on behalf of Azureus Homes Limited.
- 2.2 The mid-terrace property comprises a commercial unit on the ground floor, with single flat above.



- 2.3 Planning consent has been granted for the change of use and subdivision of the building to create two commercial units and two studio flats on the ground floor, and two one-bedroom flats on the first floor (ref. F/24/96741 & F/23/96241).
- 2.4 Figures 1 – 3 provide details of the location, the existing and the proposed layouts.
- 2.5 Condition 3 of both consents states:

No development shall commence until a noise assessment has been submitted to and approved in writing by the Local Planning Authority. The noise assessment shall include external noise levels (reflected and re-radiated noise) and mitigation (including sound insulation of the building envelope, orientation of habitable rooms away from major noise sources and details of acoustically attenuated mechanical ventilation to achieve internal room standards in accordance with the criteria of BS8233:2014).

- 2.6 The building is set in a mixed area, in a line of shops with flats above. The particular neighbours to the development site include a dry-cleaner on the west side and a take-away shop on the east.

- 2.7 It is noted that the Dry Cleaning business extends to the rear of the property, where there are a number of small ventilation extracts. These protrude into the alley of the development, running down the side of the proposed Flat 02 (see Figure 2).
- 2.8 The opening hours of the Dry Cleaners are 8.00 – 5.30 Monday to Friday, and 8.30 – 1.00 Saturday.
- 2.9 The take-away shop to the east is similarly open during fixed hours only, with no business on Sunday or Monday and then opening limited to 12.00 – 20.30 on any other day.
- 2.10 The kitchen of the take-away does feature a main extract system which runs up the back wall of the building, adjacent to the development site.
- 2.11 Given the requirements of Condition 3, it will therefore be necessary to ensure the scheme provides sufficient protection for any prospective occupants of the new buildings
- 2.12 Ian Sharland Limited have been commissioned to investigate the current situation and this report will:
- (i) Describe a long term survey of ambient noise levels at the front and rear of the premises.
 - (ii) Confirm the required noise targets within the new dwellings, and hence the sound insulation performance required through the facades
 - (iii) Describe a suitable form of construction to achieve this requirement
 - (iv) Discuss the question of ventilation, and whether an open window strategy can be employed here.

3. SURVEY OF EXISTING NOISE LEVELS

- 3.1 The first step in determining the existing ambient noise level was to conduct an extended noise survey on site.
- 3.2 The survey ran from Wednesday 5th June 2024 to Monday 10th June 2024.
- 3.3 Rion NL52 sound level meters were set up on the first floor of the building, on the front and rear elevations. Microphones were projected through open windows, 1m in front of the façade (see Figure 1).
- 3.4 The equipment was configured to measure 5-minute samples of the following acoustic parameters:
- L_{Aeq} The A-weighted equivalent continuous sound pressure level which, over the sample period, contains the same acoustic energy as the time-varying signal being recorded.
- $L_{Amax,f}$ The A-weighted maximum sound pressure level recorded during each sample period (as measured on fast response).
- L_{A90} A statistical parameter, representing the A-weighted noise level exceeded for 90% of each sample period. This gives a measure of the underlying noise, and is commonly used to describe the ambient background noise.
- 3.5 The equipment was calibrated before and after the survey and showed no significant variance. Weather conditions through the survey period are shown below:

Date	Average Temp °C	Events	Average Wind Speed, m/s	Wind Direction
Wednesday 5 th June	13	None	0.9	NW
Thursday 6 th June	13	None	0.9	W
Friday 7 th June	13	None	1.4	SW
Saturday 8 th June	16	None	1.4	W
Sunday 9 th June	14	None	1.4	W
Monday 10 th June	12	Rain am	1.4	W

Table 3.1 – Weather Conditions During Survey

- 3.6 Figures 4 & 5 indicates the variation in overall noise level across the survey period at each monitoring position.
- 3.7 The traces indicate a typical diurnal noise profile, with rising levels during the day, and minimum levels in the early hours of the morning.

3.8 The results from this exercise are summarized in Table 3.2.

Location / Period		Daytime L _{Aeq} , 07.00 – 23.00	Night-time L _{Aeq} , 23.00 – 07.00	Night-time Typical L _{Amax} , fast
Front Elevation				
Wednesday 5 th June	dB(A)	64.8	54.6	77
Thursday 6 th June	dB(A)	62.8	57.2	77
Friday 7 th June	dB(A)	62.1	61.0	82
Saturday 8 th June	dB(A)	61.7	53.4	77
Sunday 9 th June	dB(A)	62.1	55.2	79
Rear Elevation				
Wednesday 5 th June	dB(A)	49.2	40.0	61
Thursday 6 th June	dB(A)	54.8	37.9	61
Friday 7 th June	dB(A)	52.4	37.4	59
Saturday 8 th June	dB(A)	51.4	37.9	58
Sunday 9 th June	dB(A)	45.4	40.7	57

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

3.9 The L_{Amax} levels shown in Table 3.2 are the peak values based on the 90th percentile and therefore represents the level which was exceeded 10 times during the night.

3.10 These long-term samples, particularly those at the rear, reflected the contribution of noise from all sources, including those items of plant serving the adjacent shop & take-away. Separate checks of the noise produced by these indicated the following noise levels outside the nearest window on the site:

Take-away extract 52 dB(A) @ 1st floor bedroom window
Dry-Cleaner exhaust 63 dB(A) @ Flat 02 Entrance, and @ 1st floor bedroom window

3.11 The significance of the measured noise levels will be discussed below.

4. ASSESSMENT OF NOISE LEVELS

4.1 National Planning Policy Framework (December 2023)

- 4.1.1 The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally prepared plans for housing and other development can be produced.
- 4.1.2 Planning law requires that applications for planning permission be determined in accordance with the development plan, unless material considerations indicate otherwise. The National Planning Policy Framework must be considered in preparing the development plan and is a material consideration in planning decisions. Planning policies and decisions must also reflect relevant international obligations and statutory requirements.
- 4.1.3 The purpose of the planning system is to contribute to the achievement of sustainable development. At a very high level, the objective of sustainable development can be summarised as meeting the needs of the present without compromising the ability of future generations to meet their own needs.
- 4.1.4 Paragraphs 180, 191 & 193 of the NPPF states:

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

- (a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
- (b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;*
- (c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
- (d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- (e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and*
- (f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.*

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 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^[1] ;*
- 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.*

4.2 National Policy Statement for England (March 2010)

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

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

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

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

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

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

^[1] Refers here to the NPSE, discussed in Section 3.2 of this report.

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

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

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

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

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

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

4.3 Planning Practice Guide 'Noise' (July 2019)

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

When is noise relevant to planning?

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

What are the observed effect levels?

- *Significant observed adverse effect level: This is the level of noise exposure above which significant adverse effects on health and quality of life occur.*
- *Lowest observed adverse effect level: this is the level of noise exposure above which adverse effects on health and quality of life can be detected.*
- *No observed effect level: this is the level of noise exposure below which no effect at all on health or quality of life can be detected.*

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

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

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

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

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

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

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

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

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

Table 4.1 – Noise Exposure Hierarchy

4.3.3 The guidance further advises:

What factors influence whether noise could be a concern?

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

These factors include:

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

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

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

More specific factors to consider when relevant include:

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

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

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

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

- a relatively quiet facade (containing windows to habitable rooms) as part of their dwelling.
- a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced if this area is exposed to noise levels that result in significant adverse effects.
- a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or
- a relatively quiet, protected, external publically accessible amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5-minute walking distance).

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

- *a relatively quiet facade (containing windows to habitable rooms) as part of their dwelling, and/or;*
- *a relatively quiet external amenity space for their sole use, (e.g. a garden or balcony). Although the existence of a garden or balcony is generally desirable, the intended benefits will be reduced with increasing noise exposure and could be such that significant adverse effects occur, and/or;*
- *a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings, and/or;*
- *a relatively quiet, protected, external publically accessible amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minute walking distance).*

4.4 Eastleigh Borough Council Local Plan 2016 – 2032

4.4.1 The local authorities adopted Local Plan sets out the manner in which it will apply national planning guidance to the local area.

4.4.2 In respect of Pollution, including noise, the Plan advises:

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

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

Wherever possible, developments should use site and building layout and design to manage levels of noise on development sites. Where acceptable internal noise levels cannot be met with open windows, alternative ventilation will be required. Where the development site is affected by air pollution in addition to noise, early consideration of the location of air ventilation inlets is recommended. The following standards will be used to assess the acceptability of development proposals affected by steady external noise sources:

In respect of the Solent and Southampton Water SPA and Ramsar sites and supporting habitat, construction noise should be kept below 69dBA max either alone or in combination with other developments (measured at the sensitive receptor which is the nearest point of the SPA/Ramsar or supporting habitat) during the bird overwintering period, or works timed so that they do not coincide with the wintering bird season. Natural England will provide advice on a case by case basis where construction noise exceeds 69dBA max

4.4.2 This approach is captures in Policy DM8 Pollution:

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

4.4.3 For residential developments, the particular targets to be applied, generally, are as follows:

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

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

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

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

- 4.5.1 There is much guidance on the levels of intrusive noise which would be considered acceptable within residential accommodation such as this. Typical advice is found in British Standard 8233:2014 "Guidance on Sound Insulation and Noise Reduction for buildings". Following similar guidance in the 1999 World Health Organisation report "Guidelines for Community Noise", the Standard sets out the following limits for indoor ambient noise levels within living rooms and bedrooms of residential accommodation. This suggests:

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

Table 4.2 - BS8233 Indoor Guideline Values

- 4.5.2 It is usually considered that an open window will provide a reduction of some 10-15 dB(A)¹. Therefore the 'good' internal standards quoted above would broadly equate to the following targets immediately outside the buildings:

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

Table 4.3 - BS8233 Derived Facade Guideline Values

- 4.5.3 BS8233 recognises that, where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB, and reasonable conditions will be achieved².
- 4.5.4 It should be noted that the levels quoted in BS8233 are intended to reflect the acceptability of steady, continuous noise. Sources of intermittent and tonal noise may generate greater annoyance for a similar overall magnitude. Whilst BS8233 does not explicitly state a correction for those circumstances, it may be appropriate to consider that the Good and Reasonable standards would be achieved with levels which are perhaps 5 dB lower than stated in the table above.
- 4.5.5 It is also noted that BS8233 was written from a view of designing new buildings to protect occupants from existing noise sources. This does necessarily infer, however, that the acceptability of an occupant to an absolute level noise within a building will be different if the introduction of the noise source post-dates the construction of the building.

¹ Reference PPG24 Planning & Noise, which adopted a mid-range value of 13 dB(A)

² Note, the relaxation specified in BS8233 must be read in conjunction with parallel guidance set out in Approved Document O.

4.6 World Health Organisation Guidelines

- 4.6.1 Further advice is provided in the 1999 WHO report "Guidelines for Community Noise".
- 4.6.2 This indicates that the steady noise level in external amenity areas, such as gardens or outdoor living areas should not exceed 55 dB(A) $L_{Aeq, t}$, and should preferably be designed below 50 dB(A) $L_{Aeq, t}$.
- 4.6.3 The document also provides guidance on the impact of peak noise levels on sleeping conditions. This suggests that levels above 45 dB(A) L_{Amax} inside a bedroom would be disturbing to sleep. With windows open, this would equate to a level of approximately 58 dB(A) L_{Amax} externally.

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

- 4.7.1 Noting that Approved Document O Overheating is not applied to converted properties, the Institute of Acoustic and Association of Noise Consultants published the 'Acoustics Ventilation and Overheating – Residential Design Guide' (January 2020) to promote best practice in the design of residential buildings to control overheating in areas of high ambient noise.
- 4.4.2 When providing design targets inside the dwellings, the AVOG document advises that the internal noise standard of BS8233:2014 (as copied here in Table 5.1) should be achieved when providing adequate ventilation as defined in Approved Document F. However, the document continues to propose that it is considered reasonable to allow higher levels of internal ambient noise from transport sources when higher rates of ventilation are required in relation to the overheating condition.
- 4.7.3 This proposition is based on the fact that overheating will occur for only part of the time, during which there will be a trade-off between acoustic and thermal conditions, given that residents would have some control over their environment (a principle well established in the field of thermal comfort).
- 4.7.4 The guide indicates that the sound level difference across a façade, with standard opening windows, would be 13 dB(A), but that this figure may be greater if windows are shielded by balconies.
- 4.7.5 BS8233:2014 states that, if internal noise levels are no more than 5 dB greater than the levels shown here in Table 4.2, this would be a 'reasonable' standard. Therefore, if external noise levels do not exceed the following values when windows are open, conditions should be considered wholly acceptable, and therefore the threshold between No and Low Observed Adverse Effect Levels:

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

Table 4.4 – Proposed LOAEL Façade Noise Levels with Windows Open

4.7.6 To consider the upper limit, beyond which internal conditions should not be deemed acceptable, reference is made to issue of speech interference. With reference to the numerical values in BS8233 (see Table 4.6 above), the AVOG document adopts an internal daytime limit of 50 dB(A), which would then equate to an external limit of 63 dB(A) when windows are open.

4.7.7 At night, reference is made to the WHO Night Noise Guidelines, which developed the original WHO Guidelines for Community Noise report. This states that if external noise levels exceed 55 dB(A) L_{Aeq} , 'adverse health effects occur frequency and a sizeable proportion of the population is highly annoyed and sleep disturbed'.

4.7.8 The table below therefore may be taken to represent the threshold for SOAEL:

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

Table 4.5 – Proposed SOAEL Threshold Façade Noise Levels with Windows Open

5. RECOMMENDATIONS FOR NOISE ATTENUATION MEASURES

External Façade

5.1 Section 4.4.1 of this report has confirmed the British Standard guidance for internal noise levels within residential properties.

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

Living Rooms/Bedrooms: ≤ 35 dB(A) L_{Aeq} , 07.00 – 23.00
Bedrooms: ≤ 30 dB(A) L_{Aeq} , 23.00 – 07.00, and
 ≤ 45 dB(A) L_{Amax} , 23.00 – 07.00³

5.3 Table 5.1 below defines the predicted external façade noise levels, dB(A), and overall performance targets for the facades of the building. These figures are based initially on the targets of Para 5.2 and the measured noise levels given in Table 3.2.

5.4 The value quoted below for the rear elevation during the day time (*) reflects the worst case situation when extract fans associated with neighbouring businesses are in operation (rather than the average across the full 16 hrs).

	Predicted Façade Noise Levels			Target Reduction Across Facades	
Room Type	Living Rooms	Bedrooms		Living Rooms	Bedrooms
Elevation	L_{Aeq} , 16 hrs	L_{Aeq} , 8hrs	$L_{Amax,f}$	dB(A)	dB(A)
Front	65	N/A	N/A	30	N/A
Rear	63*	40	60	28	15

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

5.5 The existing wall construction appears to be a cavity masonry specification, and therefore offers a high level of sound insulation.

5.6 The critical elements are the form of glazing and the provision of ventilation.

5.7 On the front elevation, the proposed floor plans indicate living rooms only. The required sound insulation is a difference of 30 dB(A), and it is proposed that this can be achieved with a glazing configuration rated at 30 dB $R_w + C_{tr}$.

5.8 At the rear of the building, noise levels are significantly lower in absolute terms, and a standard double glazing unit would be sufficient (27 dB $R_w + C_{tr}$).

5.9 If background trickle ventilators are proposed, these should achieve ratings of 38 & 32 dB $D_{n,e,w}$ at the front and rear elevations respectively.

³ Excepting no more than 10 events per night.

5.10 Appendix 1 provides calculations to support these propositions and Table 5.2 summarises the specific acoustic requirements for glazing and trickle ventilators:

Frequency	Hz	63	125	250	500	1K	2K	4K	8K	Rw + Ctr	Config
Glazing											
Front Elevation	dB	14	24	28	31	43	39	45	45	30	4 / 20 / 6
Rear Elevation	dB	21	21	18	26	37	42	33	35	27	4 / 16 / 4
Frequency	Hz	63	125	250	500	1K	2K	4K	8K	Dn,e,w	Vent Type
Vents											
Front Elevation	dB	42	42	38	35	36	42	43	38	38 (Open)	Simons EHAS
Rear Elevation	dB	40	39	35	35	31	32	35	40	32 (Open)	Simons FV

Table 5.2 – Proposed Glazing and Ventilation Types (Sound Insulation Performance, R dB)

5.11 Condition 3 of the planning consent includes the following clause:

“and details of acoustically attenuated mechanical ventilation to achieve internal room standards in accordance with the criteria of BS8233:2014)”

5.12 Whilst the glazing and trickle ventilator schedule above will protect internal amenity when windows are closed. When windows are open, however, levels will rise to the values indicated below (taking a loss of 13 dB(A) through a partially open window:

	Predicted Façade Noise Levels			BS8233 Targets (Exceedance)	
Room Type	Living Rooms	Bedrooms		Living Rooms	Bedrooms
Elevation	L _{Aeq} , 16 hrs	L _{Aeq} , 8hrs	L _{Amax,f}	dB(A)	dB(A)
Front	52	N/A	N/A	35 (22)	N/A
Rear	50*	27	47	35 (15)	30 / 45 (2)

Table 5.3 – Predicted Internal Noise Levels (Windows open)

5.13 The guidance of the AVOG publication (Section 4.7) suggests that a 5 dB tolerance on the BS8233 targets is acceptable when windows are open. On that basis, the bedrooms of the development could rely upon on open windows at night (re Table 4.3).

5.16 During the day, noise level within both living rooms and bedrooms (for day time occupancy) would be above the threshold values, and mechanical solutions would be appropriate.

5.16 Options here should be considered by the Client and their mechanical designers, but could include individual Positive Input Ventilation (PIV) supply air fans, serving individual habitable rooms. One example would be the Flatmaster range by Nuaire.

FIGURE 1 – SITE LOCATION PLAN

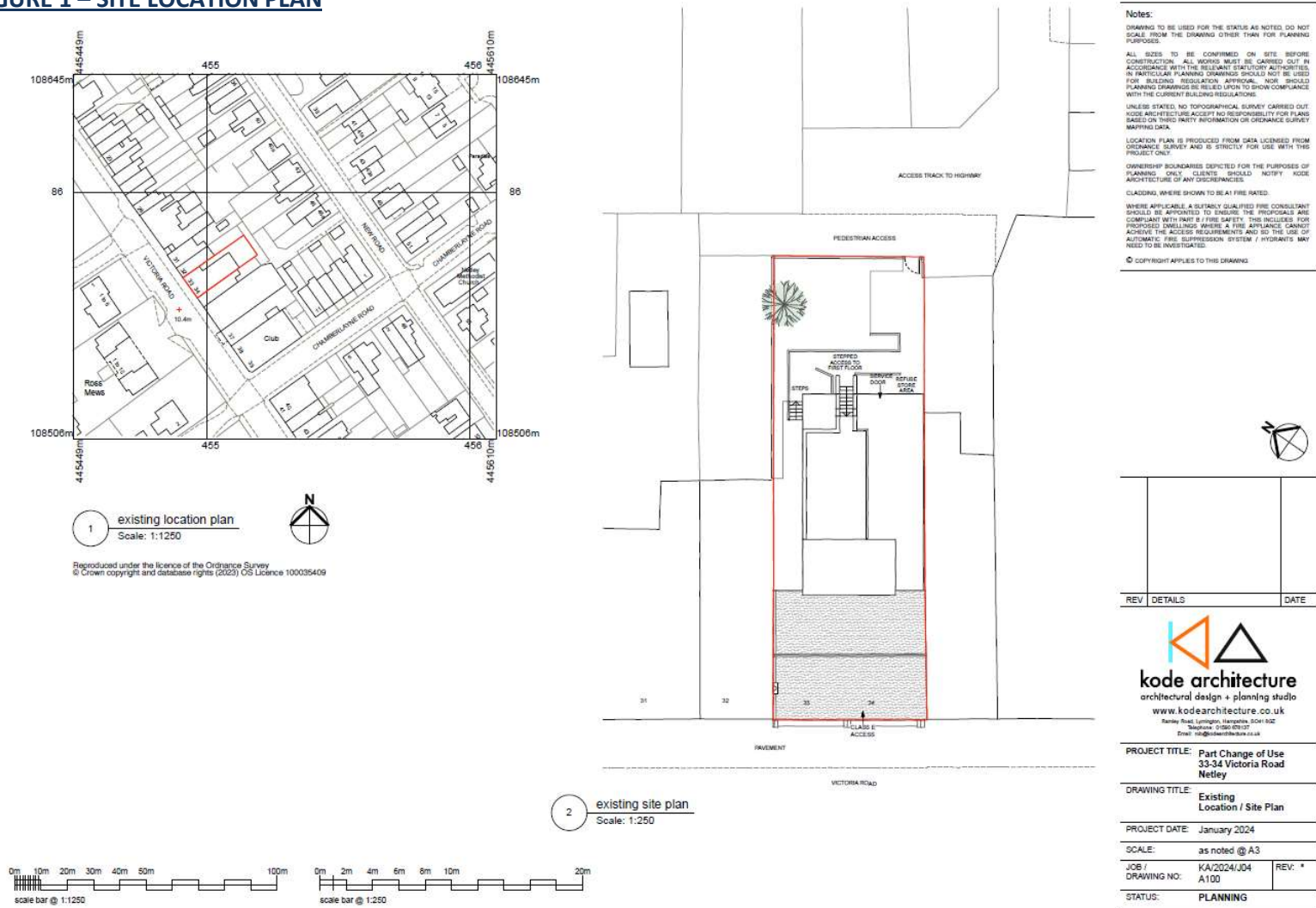


FIGURE 2 – PROPOSED FLOOR PLANS (GROUND FLOOR CHANGES)

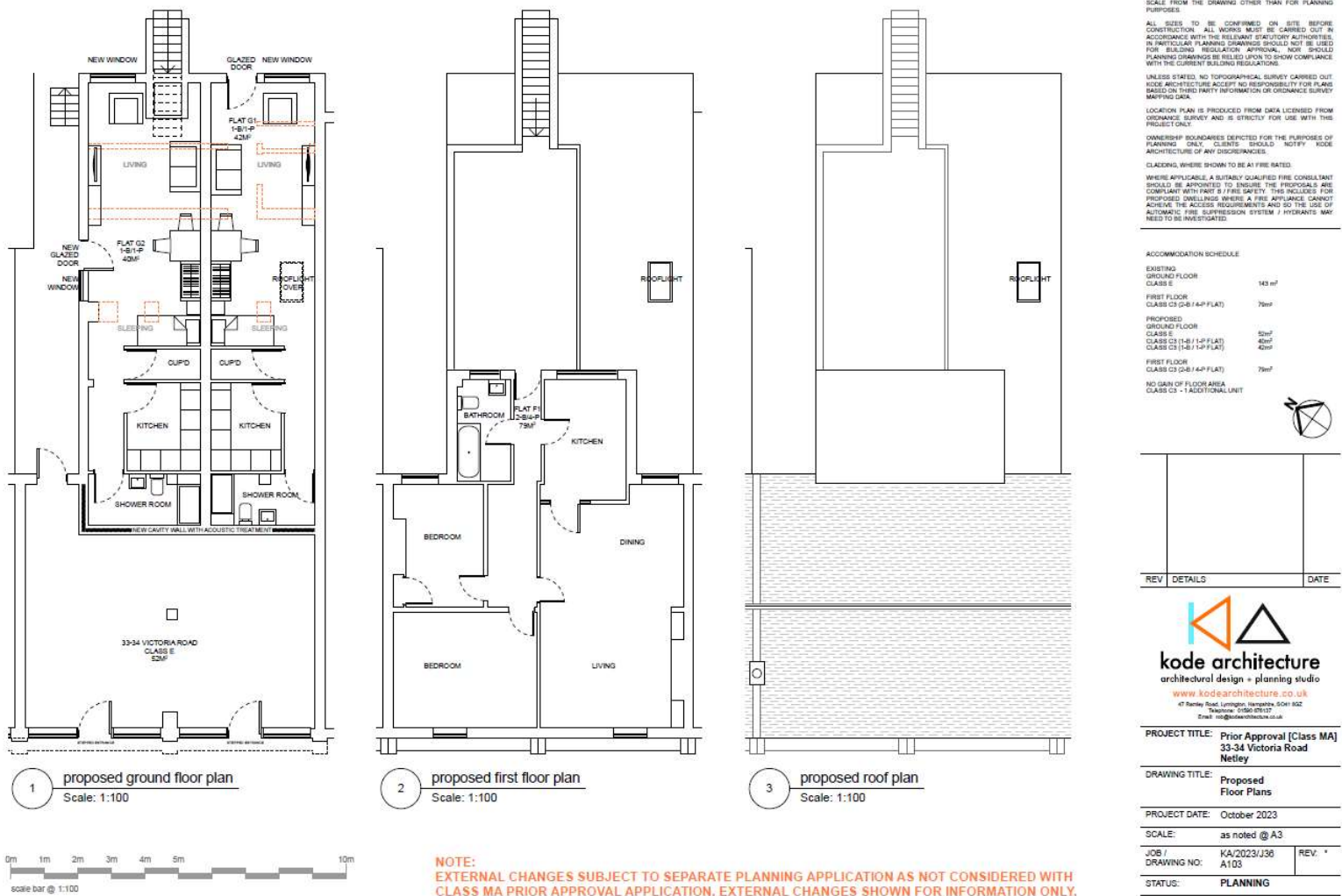


FIGURE 3 – PROPOSED FLOOR PLANS (GROUND & 1ST FLOOR CHANGES)

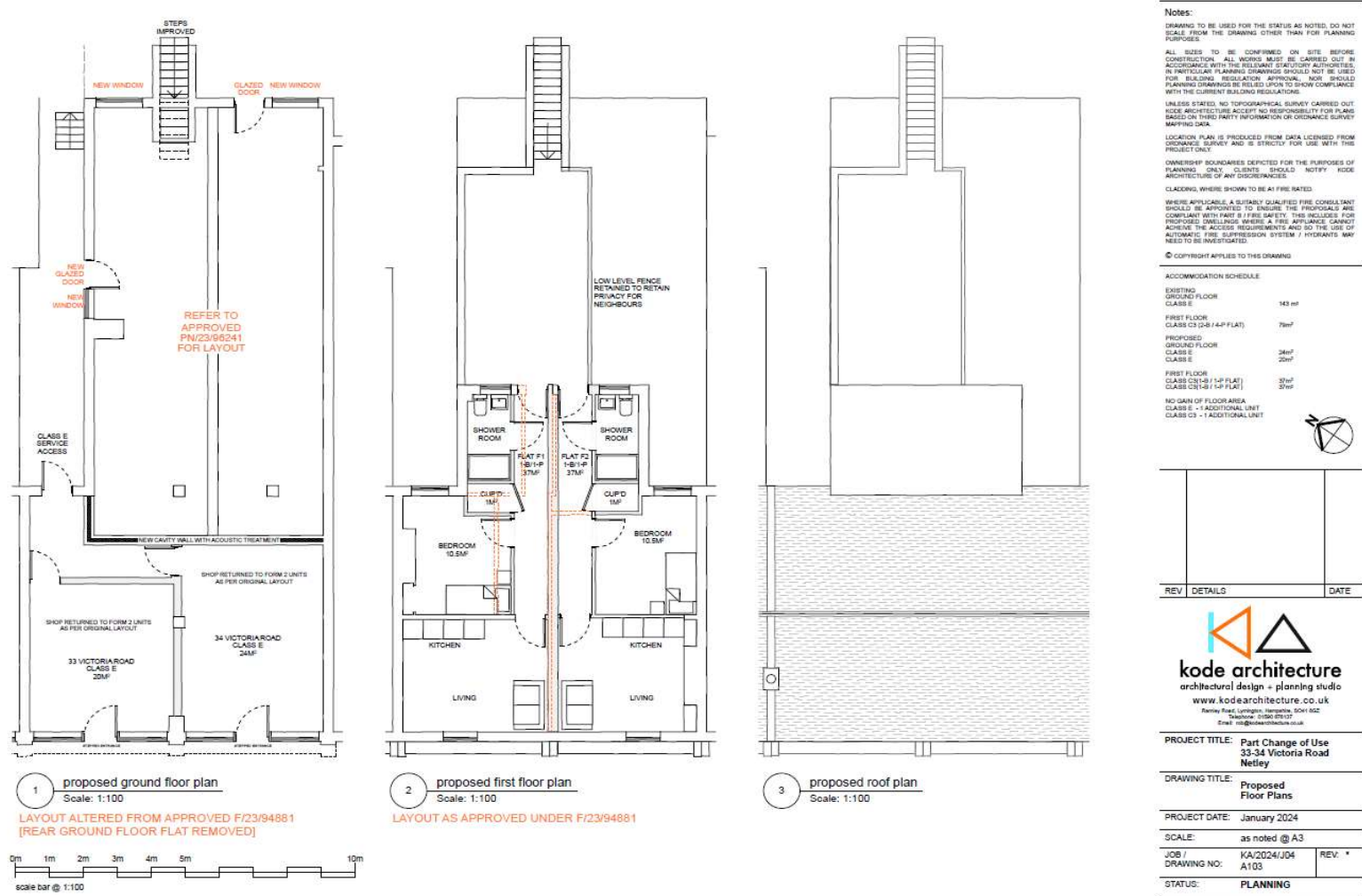


FIGURE 4 – MEASURED NOISE LEVELS, VICTORIA ROAD

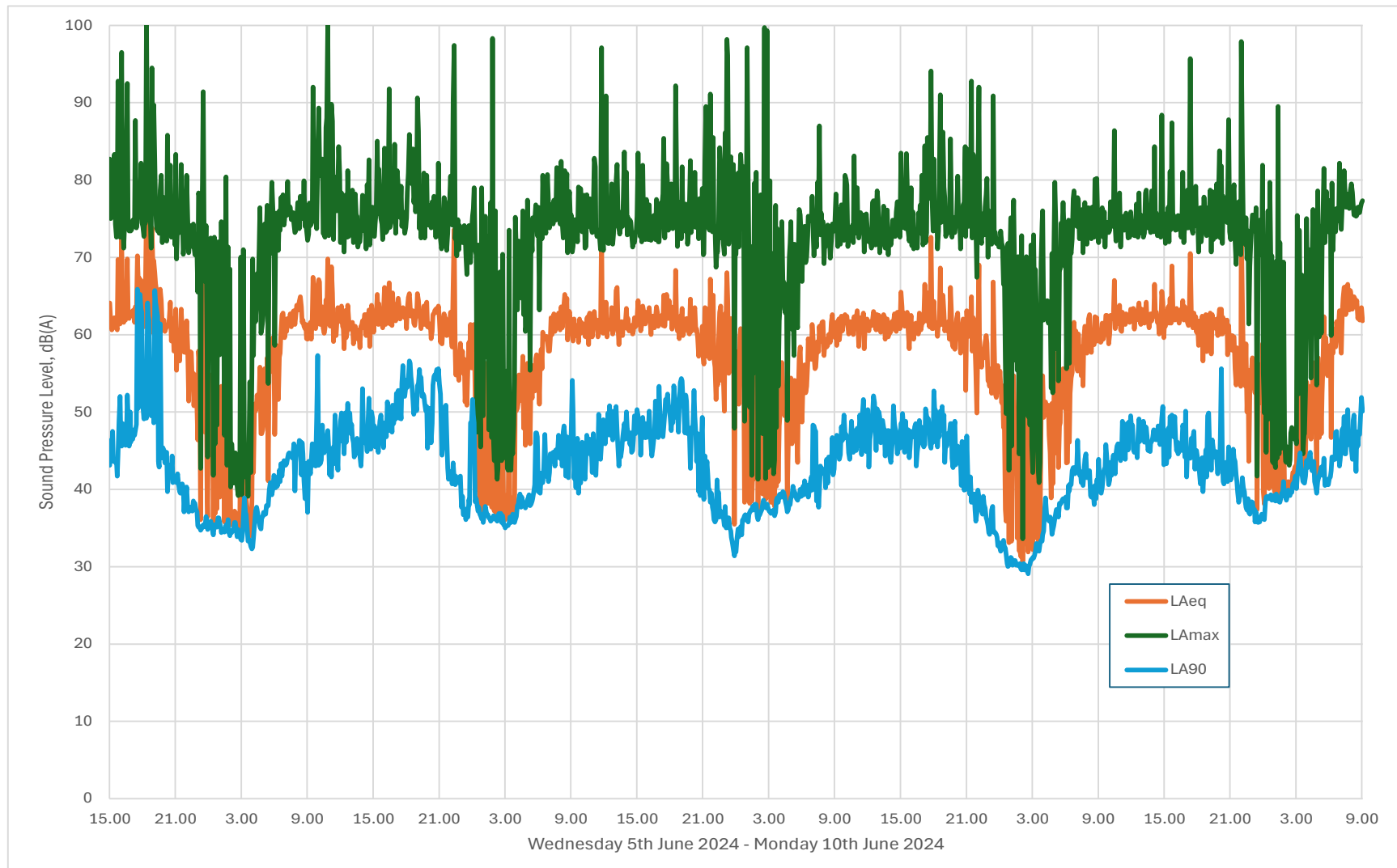
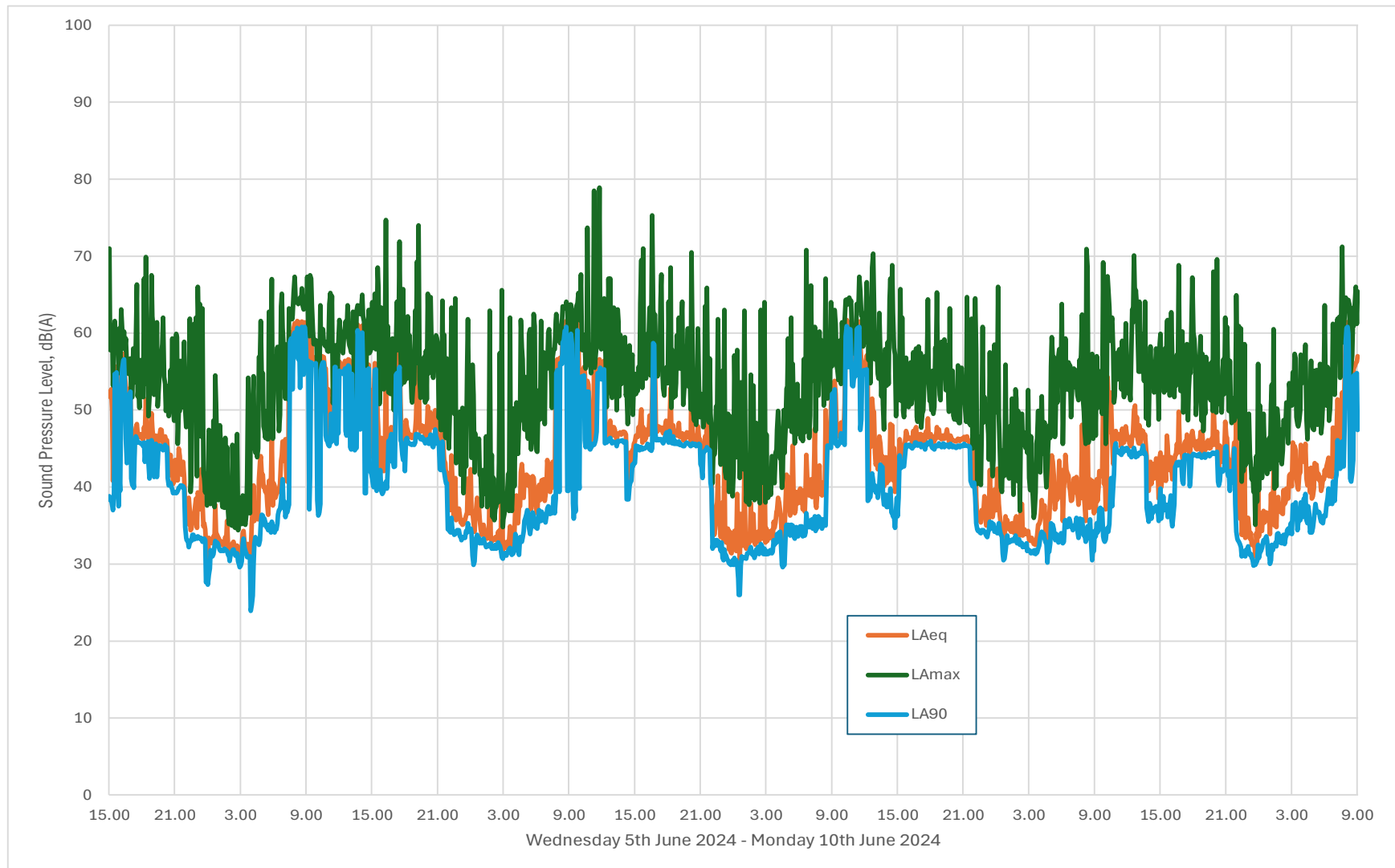


FIGURE 5 – MEASURED NOISE LEVELS, REAR ELEVATION



APPENDIX I: CALCULATION OF OUTSIDE TO INSIDE NOISE LEVELS

Plots										
Front Elevation		Living Room								
Frequency	Hz	63	125	250	500	1K	2K	4K	8K	dB(A)
Façade Level Day, LAeq, 16 hrs	dB	69	64	62	60	62	56	46	40	65
SRI Glazing, 4/20/6, 30 Rw + Ctr	dB	14	24	28	31	43	39	45	45	
Area Correction, 2m2	dB	3	3	3	3	3	3	3	3	
Room Volume	m3	30	30	30	30	30	30	30	30	
Typ. Reverberation Time	s	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Room Absorption	m2	10	10	10	10	10	10	10	10	
Absorption Correction	dB	-10	-10	-10	-10	-10	-10	-10	-10	
Net SPL		48	33	27	22	12	10	-6	-12	26
SRI Masonry Leaf	dB	37	40	38	40	48	55	61	65	
Area Correction, 15m2	dB	12	12	12	12	12	12	12	12	
Absorption Correction	dB	-10	-10	-10	-10	-10	-10	-10	-10	
Net SPL	dB	34	26	26	22	16	3	-13	-23	23
Trickle Vents										
Proposed, 38 dB Dn,e,w	dB	42	42	38	35	36	42	43	38	
Absorption Correction ref 10m2	dB	0	0	0	0	0	0	0	0	
Net SPL	dB	27	22	24	25	26	14	3	2	28
Tolerance on Calculation	dB	2	2	2	2	2	2	2	2	
Predicted LAeq, 16 hrs	dB	50	36	33	30	29	18	6	4	33

Plots										
Rear Elevation		Living Room								
Frequency	Hz	63	125	250	500	1K	2K	4K	8K	dB(A)
Façade Level Day, LAeq, 16 hrs	dB	69	67	66	59	56	54	48	40	63
SRI Glazing, 4/16/4, 27 Rw + Ctr	dB	21	21	18	26	37	42	33	35	
Area Correction, 2m2	dB	3	3	3	3	3	3	3	3	
Room Volume	m3	50	55	55	55	55	55	55	55	
Typ. Reverberation Time	s	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Room Absorption	m2	16	18	18	18	18	18	18	18	
Absorption Correction	dB	-12	-12	-12	-12	-12	-12	-12	-12	
Net SPL		39	37	39	24	10	3	6	-4	31
SRI Masonry Leaf	dB	37	40	38	40	48	55	61	65	
Area Correction, 18m2	dB	13	13	13	13	13	13	13	13	
Absorption Correction	dB	-12	-12	-12	-12	-12	-12	-12	-12	
Net SPL	dB	32	27	28	19	8	-1	-13	-25	22
Trickle Vents										
Proposed, 32 dB Dn,e,w	dB	40	39	35	35	31	32	35	40	
Absorption Correction ref 10m2	dB	-2	-2	-2	-2	-2	-2	-2	-2	
Net SPL	dB	27	26	29	22	23	20	11	-2	27
Tolerance on Calculation	dB	2	2	2	2	2	2	2	2	
Predicted LAeq, 16 hrs	dB	42	39	41	29	25	22	14	2	35

Plots	Room									
Rear Elevation	Bedroom									
Frequency	Hz	63	125	250	500	1K	2K	4K	8K	dB(A)
Façade Level Day, LAeq, 8 hrs	dB	44	39	37	35	37	31	21	15	40
Façade Level Night, LAmax	dB	58	58	56	56	57	51	41	30	60
SRI Glazing, 4/16/4, 27 Rw + Ctr	dB	21	21	18	26	37	42	33	35	
Area Correction, 2m2	dB	3	3	3	3	3	3	3	3	
Room Volume	m3	25	25	25	25	25	25	25	25	
Typ. Reverberation Time	s	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Room Absorption	m2	8	8	8	8	8	8	8	8	
Absorption Correction	dB	-9	-9	-9	-9	-9	-9	-9	-9	
Net LAeq, 8 hrs	dB	17	12	13	3	-6	-17	-18	-26	6
Net LAmax, night	dB	31	31	32	24	14	3	2	-11	26
SRI Masonry Leaf	dB	37	40	38	40	48	55	61	65	
Area Correction, 2.5m2	dB	4	4	4	4	4	4	4	4	
Absorption Correction	dB	-9	-9	-9	-9	-9	-9	-9	-9	
Net LAeq, 8 hrs	dB	2	-6	-6	-10	-16	-29	-45	-55	-9
Net LAmax, night	dB	16	13	13	11	4	-9	-25	-40	11
Trickle Vents										
Proposed, 32 dB Dn,e,w	dB	40	39	35	35	31	32	35	40	
Absorption Correction ref 10m2	dB	1	1	1	1	1	1	1	1	
Net LAeq, 8 hrs	dB	5	1	3	1	7	0	-13	-24	9
Net LAmax, night	dB	19	20	22	22	27	20	7	-9	29
Tolerance on Calculation	dB	2	2	2	2	2	2	2	2	
Predicted Day Time LAeq, 8hrs	dB	19	14	15	7	9	2	-10	-20	13
Predicted Night Time LAmax	dB	33	33	34	28	29	22	10	-5	33

APPENDIX II: TERMINOLOGY RELATING TO NOISE

Sound Pressure	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
Sound Pressure Level	The sound level is the sound pressure relative to a standard reference pressure of 20µPa (20x10 ⁻⁶ Pascals) on a decibel scale.
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log ₁₀ (s1 / s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20µPa.
A-weighting, dB(A)	The unit of sound level, weighted according to the A scale, which considers the increased sensitivity of the human ear at some frequencies.
Noise Level Indices	Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.
Leq,T	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
Lmax,T	A noise level index defined as the maximum noise level during the period T. Lmax is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall Leq noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L90,T	A noise level index. The noise level exceeded for 90% of the time over the period T. L90 can be considered to be the "average minimum" noise level and is often used to describe the background noise.
L10,T	A noise level index. The noise level exceeded for 10% of the time over the period T. L10 can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.
Free-Field	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m.
Façade Noise Level	At 1m in front of a large sound reflecting object such as a façade.
Fast/Slow Time Weighting	Averaging times used in sound level meters.
Octave Band	Range of frequencies whose upper limit is twice the lower limit.
DnT,w	The single number quantity that characterises airborne sound insulation between rooms over a range of frequencies.
Rw	Single number quantity that characterises the airborne sound insulating properties of a material or building element over a range of frequencies.