HODKINSON

Acoustic Design Statement

Drapers' Almshouse Charity

Edmansons Close

Final

Kim Coleman
BSc (Hons), AMIOA, MCIOB

August 2022

DOCUMENT CONTROL RECORD
REPORT STATUS: FINAL

Version	Date	Reason for issue	Author	Checked by	Approved for Issue by Project Manager
v.1	02.08.22	Draft	K. Coleman	A. Finn & K. Paxton	J. Peck
v.2	30.08.22	Final	K. Paxton	J. Peck	J. Peck

ABOUT HODKINSON CONSULTANCY

Our team of technical specialists offer advanced levels of expertise and experience to our clients. We have a wide experience of the construction and development industry and tailor teams to suit each individual project.

We are able to advise at all stages of projects from planning applications to handover.

Our emphasis is to provide innovative and cost-effective solutions that respond to increasing demands for quality and construction efficiency.

Executive Summary

This report details the methodology and findings of an assessment of the noise impact on the proposed development at Edmansons Close within the London Borough of Haringey, and considers the suitability of the site for residential purposes.

Unattended noise measurements were undertaken to ascertain the noise levels from the proposed site. This data has been used to assess the internal noise levels at sensitive receptors located at the proposed development.

The main noise source to the site is local traffic from Bruce Grove. With the exception of the single new almshouse, all the new build elements and the six almshouses which are extended are all at the rear of the site where the noise levels are low or negligible.

The proposed scheme includes new dwellings and extensions to some of the existing dwellings. The criteria is based on new dwellings only but it would be acceptable for the extensions to follow the same methodology.

This report follows the ProPG method of assessment.

The results have indicated that based on the selected building elements for the scheme, the internal noise levels are predicted to achieve the daytime and night time criteria of 35 and 30dB $L_{Aeq,T}$ respectively.

The proposed scheme will incorporate the following to ensure adequate background ventilation and allow windows to be kept closed to achieve desirable internal noise levels:

> Standard (6mm/6mm/10mm) double glazing for habitable rooms and trickle ventilation to facades facing Bruce Grove.

> Standard (4mm/6mm/4mm) double glazing for habitable rooms and trickle ventilation to all other facades.

Contents

1. INTRODUCTION

1.1 This acoustic design statement has been prepared by Hodkinson Consultancy, a specialist energy and environmental consultancy for planning and development, to determine the suitability for residential purposes in relation to noise of the proposed development at Edmansons Close, within the London Borough of Haringey.

1.2 This report details the results of the baseline noise survey, undertaken to establish the existing noise levels affecting the site. The survey results have been used to assess the suitability of the site, with respect to noise.

1.3 The objective of the acoustic design statement is to consider the site suitability of constructing additional new residential buildings and extensions to some of the existing dwellings. The report will look at each of the four elements that make up an acoustic design statement and give recommendations where necessary to achieve a good acoustic design.

1.4 Where necessary and feasible, mitigation measures have been identified to provide a suitable internal acoustic environment for future occupants.

Site Location

1.5 The proposed development site at Edmansons Close is located on Bruce Grove, Tottenham in the London Borough of Haringey, as shown in Figure 1.

1.6 Bruce Grove (A10) runs from the northwest to the southeast of the site. The surrounding consists predominantly of residential buildings.

1.7 The ambient noise in the vicinity of the site during the survey was observed to be local road traffic noise from Bruce Grove.

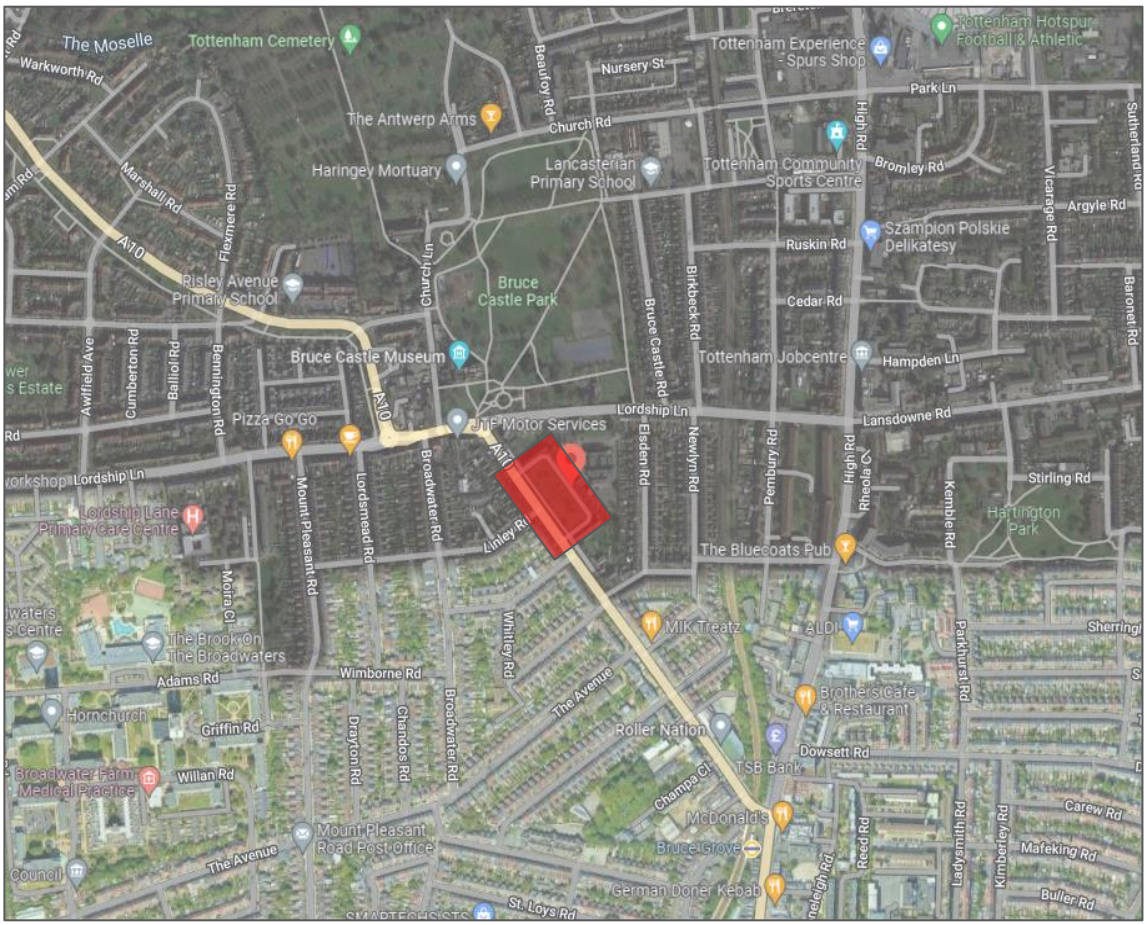


Figure 1: Site Location Google maps © 2022

Proposed Development

1.8 The redevelopment is described as follows:

'Demolition of existing laundry building and 1970s infill building; alterations and extensions to 44 existing almshouses to create 8 x 1 bed, 12 x 2 bed and 6 x 3 bed units; alterations to existing Gatehouse to provide 1 x 2 bed unit; construction of 1 x new build 3 bed almshouse to replace 1970s infill building; construction of a new apartment building comprising 7 x studio units and 9 x 1 bed units; construction of 4 x new build 2 bed units within two new pavilions (2 units in each pavilion, 4 units in total); with landscaping; improvements to access; car parking; and ancillary development thereto.'

1.9 Figure 2 indicates the proposed site plan.

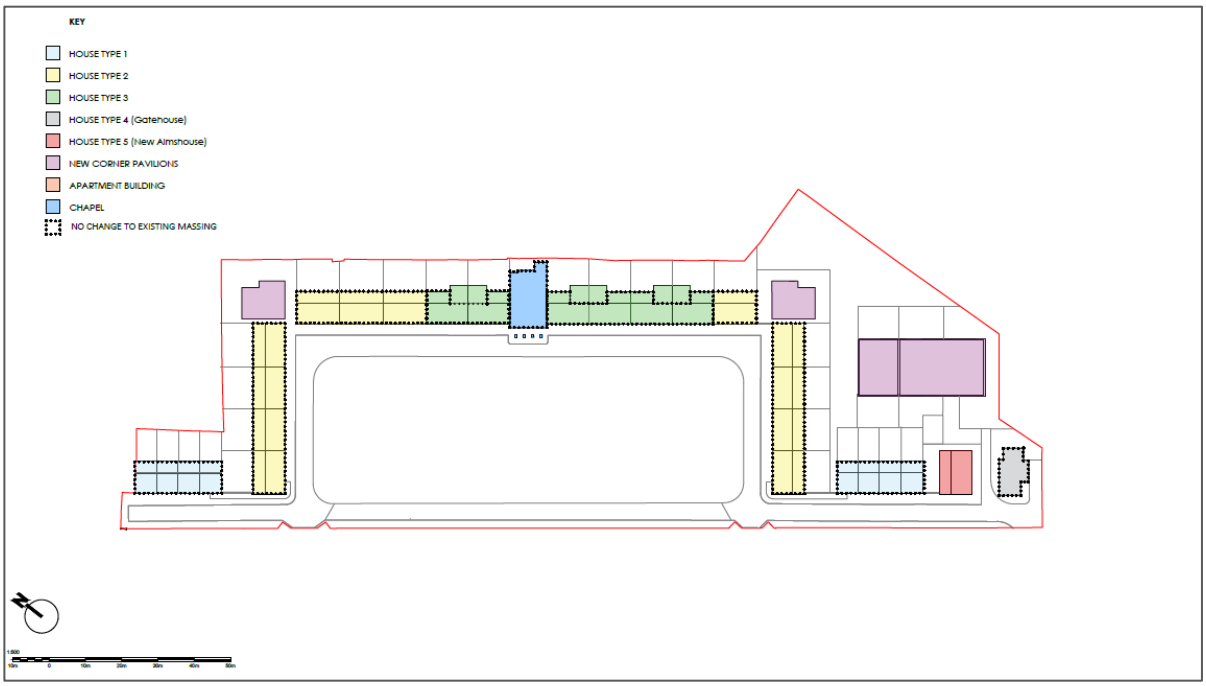


Figure 2: Proposed Site Layout – d+b studios (2022)

2. ASSESSMENT CRITERIA

Noise Policy Statement for England (NPSE)

2.1 The Noise Policy Statement for England (March 2010), sets out the long term vision of Government noise policy.

2.2 The vision of the NPSE is to 'Promote good health and a good quality of life through the effective management and control of noise within the context of Government policy on sustainable development.' This vision is supported by three key aims:

> Avoid significant adverse impacts on health and quality of life;

> Mitigate and reduce to a minimum other adverse impacts on health and quality of life; and

> Where possible, contribute to the improvement of health and quality of life.

2.3 The NPSE should apply to all forms of noise including environmental noise, neighbour noise and neighbourhood noise but does not apply to noise in the workplace (occupational noise).

2.4 The NPSE has adopted the following concepts, to help consider whether noise is likely to have 'significant adverse' or 'adverse' effects on health and quality of life:

> **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 noise.

> **LOAEL – Lowest Observed Adverse Effect Level:** This is the level above which adverse effects on health and quality of life can be detected.

> **SOAEL – Significant Observed Adverse Effect Level**: This is the level above which significant adverse effects on health and quality of life occur.

2.5 The NPSE goes on to state:

"*it is not possible to have a single objective noise-based measure that defines 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. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.*"

National Planning Policy Framework

2.6 The Ministry of Housing, Communities and Local Government revised the National Planning Policy Framework (NPPF) in July 2021. This framework updated the previous NPPF which previously replaced most national planning policy, circulars and guidance, including Planning Policy Guidance 24: Planning and Noise.

2.7 The NPPF defines the Government's planning policy for England and sets out the framework, within which local authorities must prepare their local and neighbourhood plans, reflecting the needs and priorities of their communities. The NPPF requires Local Authorities to develop local policies and make decisions which aim to prevent 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.

2.8 The NPPF requires that planning policies should also ensure that a 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:

'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; identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason'

2.9 The NPPF introduces the "Agent of Change" principle and states that planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities, and that 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.

British Standard 8233:2014

2.10 BS8233:2014 *Guidance on sound insulation and noise reduction for buildings* gives recommendations for the control of noise in and around buildings. The Standard suggests appropriate criteria and limits for different situations to guide the design of new or refurbished buildings undergoing a change of use.

2.11 Desirable upper noise levels inside residential habitable rooms are specified in the Standard and are reproduced in Table 1.

Table 1: BS8233 Indoor Ambient Noise Levels for Dwellings

Activity	Room	Ambient Indoor Noise Level 07:00 to 23:00 hrs, dB $L_{Aeq,16\,hr}$	Ambient Indoor Noise Level 23:00 to 07:00 hrs, dB $L_{Aeq,8\,hr}$
Resting	Living Room	35+	-
Dining	Dining room/ area	40	-
Sleeping (daytime resting)	Bedroom	35	30

2.12 BS8233:2014 states that 'Where development is considered necessary or desirable, despite external noise levels being above World Health Organisation (WHO) guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.'

2.13 In external amenity spaces, such as private gardens and patios, BS8233 indicates that it is desirable that the external noise level in these areas does not exceed 50 dB $L_{Aeq,T}$ with an upper guideline value of 55 dB $L_{Aeq,T}$ in noisier environments.

ProPG: Planning and Noise

2.14 The Professional Practice Guidance on Planning and Noise (ProPG) was published in May 2017 and produced jointly by the Association of Noise Consultants, the Institute of Acoustics, and the Chartered Institute of Environmental Health. The guidance adopts a 2-stage approach to assessing potential residential developments that will be exposed predominately to airborne noise from transport sources.

2.15 Stage 1 is an initial noise risk assessment of the proposed development site. This should indicate whether the site poses a negligible, low, medium, or high noise risk based on noise levels measured during the day and night-time. The aim is to describe noise levels over a "typical worst-case" 24 hour day either now or in the foreseeable future.

2.16 The Indicative Daytime ($L_{Aeq,16hr}$) and Indicative Night-time ($L_{Aeq,8hr}$) noise levels for each category are shown in Figure 3. These are combined free-field noise levels from all sources of transport noise and may also include industrial/commercial noise where this is present but is "not dominant". The levels should be assessed without the inclusion of the acoustic effect of any scheme-specific noise mitigation measures.

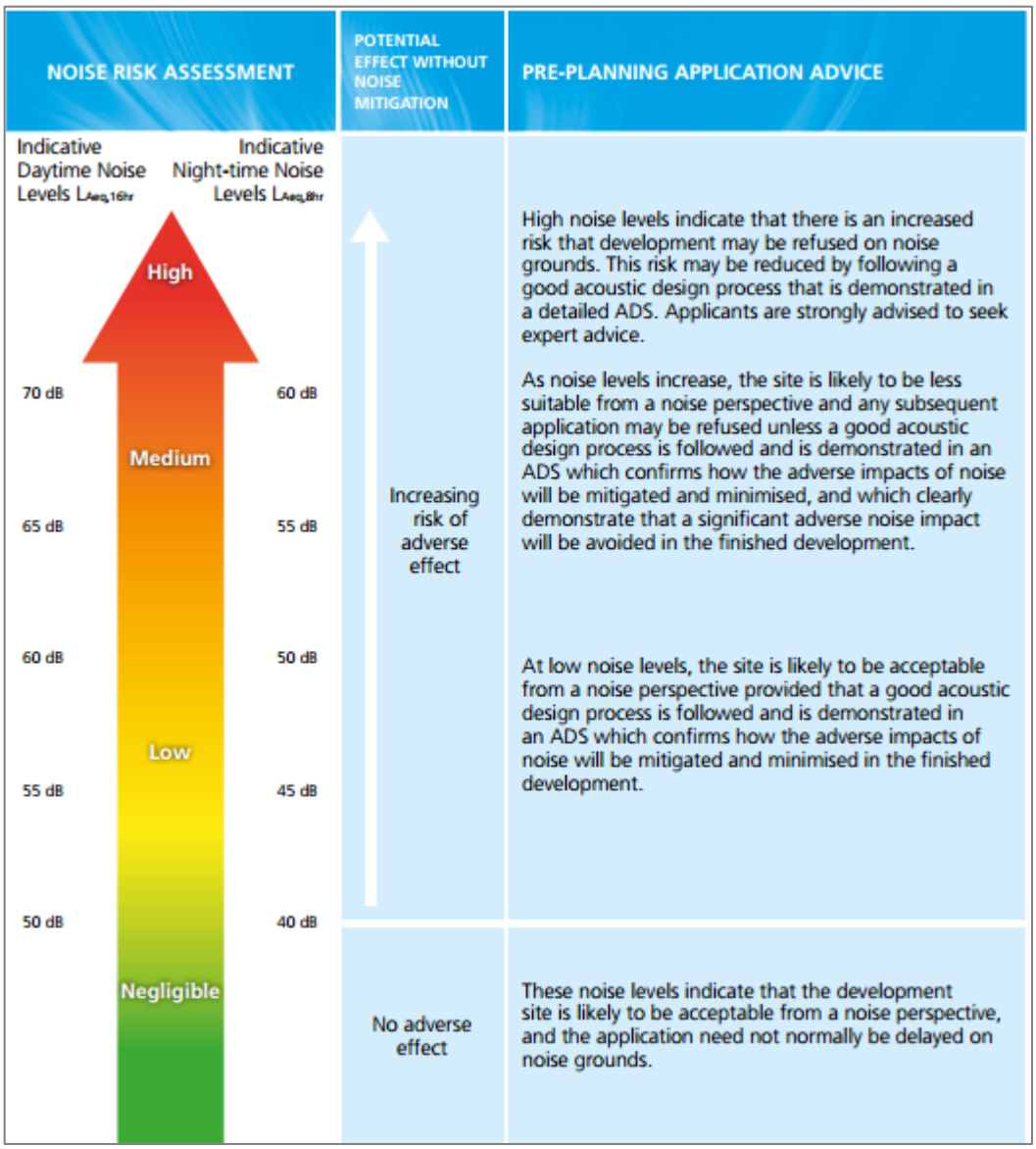


Figure 3: Stage 1 – Initial Site Noise Risk Assessment (reproduced from ProPG)

2.17 An indication that there may be more than 10 noise events at night (23:00hrs – 07:00hrs) with $L_{Amax,F}$ > 60 dB means the site should not be regarded as a negligible risk.

2.18 Stage 2 is a full assessment of four key elements to be undertaken in parallel. These are:

1. Good acoustic design
2. Internal noise level guidelines
3. External amenity area noise assessment

4. Assessment of other relevant issues

2.19 The target noise levels shown in Table 2 are based upon the levels contained in BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' and are supported by the WHO 'Community noise guidelines' 2000. In contrast to the noise levels in the Stage 1 initial risk assessment, these levels are annual averages and would normally represent typical conditions.

Table 2: ProPG Stage 2 Target Noise Levels

Activity	Location	07:00 – 23:00 Hrs	23:00 – 07:00 Hrs
Resting	Living room	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 $L_{Aeq, 8hour}$ 45 dB $L_{AF, Max*}$

2.20 Where development is considered necessary or desirable, the internal $L_{Aeq,T}$ target levels can be relaxed by up to 5dB and reasonable internal conditions still achieved.

2.21 For external amenity areas that are an intrinsic part of the overall design, noise levels should ideally not be above the range of 50 – 55dB $L_{Aeq,16hr}$.

2.22 It is acknowledged that the NPSE and the Planning Practice Guidance both advise caution when attempting to set objective standards in relation to LOAEL and SOAEL that may be applicable to a new development.

2.23 The guideline values for noise within the ProPG and WHO documents are set at the level of the lowest adverse health effect and as such, the values could form the basis of the LOAEL as referenced in the NPSE and PPG. Targeting the ProPG and WHO guidelines levels as the LOAEL should, therefore, provide a robust basis for assessment. No levels are provided within the ProPG and WHO guidance that may be directly applicable to the SOAEL and any such threshold levels will, as indicated in the above guidance, vary depending on the specific circumstances of the development and the noise climate in which it is located.

2.24 ProPG also provides criteria from BS8233 for external amenity areas and quotes from BS8233:

"… the acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB L Aeq,16hr

…. These guideline values may not be achievable in all circumstances where development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces but should not be prohibited."

World Health Organisation

2.25 Guideline values for community noise in specific environments are presented in the WHO *Guidelines for Community Noise* document. The guideline values pertinent to this noise assessment are presented in Table 3: WHO Guideline Noise Values

Table 3: WHO Guideline Noise Values

Specific Environment	Critical Health Effect(s)	dB $L_{Aeq,T}$	Time Base hours	dB $L_{Amax,F}$
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside bedrooms	Sleep disturbance, night-time	30	8	45

London Borough of Haringey

2.26 London Borough of Haringey provides the following policies within their Development Management Document:

2.27 Policy DM23: Environmental Protection - Noise and Vibration

> The Council will seek to ensure that new noise sensitive development is located away from existing or planned sources of noise pollution. Proposals for potentially noisy development must suitably demonstrate that measures will be implemented to mitigate its impact.

> A noise assessment will be required to be submitted if the proposed development is a noise sensitive development, or an activity with the potential to generate noise.

3. ENVIRONMENTAL NOISE SURVEY AND PROPG RISK ASSESSMENT

Continuous Baseline Noise Survey and ProPG Risk Assessment

3.1 Long-term unattended noise measurements were conducted between 14:00 on Tuesday 11 August to 09:00 on Thursday 13 August 2020. The noise monitor was located to measure the noise sources around the vicinity of the site, namely local traffic. The measurement location has been labelled in Figure 4 below.

Figure 4: Noise Monitoring location; (QRP Document Draft; d+b Studios; January 2020)

Table 4: Noise Monitoring Equipment

Manufacturer	Model No.	Description	Serial No.	Calibration Due Date
Rion Rion	NL52 NL74	Sound Level Meter Calibrator	00231668 35173596	March 2021 January 2021

3.2 The sound level meter was configured to measure A-weighted indices, which included $L_{Amax,F}$, $L_{A10,\ 1min}$, $L_{Aeq,\ 1min}$ and $L_{A90,\ 1min.}$ 15-minute measurements were obtained at each monitoring location, to understand the contribution of the road traffic noise on the ambient noise levels.

3.3 The sound level meter had calibration checks before and after the measurement survey to generate a calibration level of 94 dB at 1kHz and no calibration drift was observed. The microphone was fitted with a windshield. Measurements were carried out in accordance with the requirements of BS 7445-2:1991 and ISO 1996-2:1987.

Weather Conditions

3.4 Weather conditions during the site visits are presented below in Table 5.

3.5 A history of the weather conditions during the continuous survey period has been obtained from an internet source (www.wunderground.com London City Airport) which is the closest weather station to the site with full data.

Table 5: Weather Conditions During Site Visits

Site Visit	Date and Time	Noted Weather
Setup	11/08/20 14:00	Sunny, No rain, 0/8 cloud, 32°C, windspeed <1 m/s
Collection	13/8/20 09:00	Sunny No rain, 0/8 cloud, 27°C, windspeed <1 m/s

3.6 The weather is deemed to have caused no significant effect during the measurement period.

Continuous Noise Survey Results

3.7 A summary of the time-averaged ambient noise levels and background noise level, along with typical maximum noise levels are presented in Table 6. The L_{A90} background noise level has been derived considering the most commonly occurring 15 minute period whilst the $L_{Amax,F}$ maximum noise level is the 90th percentile of the measured maximum noise levels. The full results of the continuous noise monitoring survey are shown graphically in Appendix C.

Table 6: Summary of LT1 Unattended Baseline Noise Measurements

Date	Measured Noise Levels, dB					
	Daytime (07:00 - 23:00)			Night-time (23:00 - 07:00)		
	$L_{Amax,F}$	$L_{Aeq,16hr}$	$L_{A90,16hr}$	$L_{Amax,F}$	$L_{Aeq,8hr}$	$L_{A90,8hr}$
11/08/2020	91	66	52	84	64	36
12/08/2020	97	67	53	84	63	34
13/08/2020	83	67	53			
Average	**90**	**67**	**53**	**83**	**64**	**35**

Attended Noise Survey

3.8 Supplementary short-term attended noise measurements were obtained on Tuesday 11 August 2018 between 10:00 and 12:54 at monitoring locations labelled as ST1-ST5 on the site location plan in Figure 5.

Figure 5: Mark-up of Attended Noise Survey; (QRP Document Draft; d+b Studios; January 2020)

3.9 These attended noise measurements were obtained using the equipment detailed in Table 4. The meter was fitted with a windshield and mounted on a tripod to elevate the microphone 1.5 m above local ground.

3.10 The sound level meter was configured to measure A-weighted indices, which included $L_{Amax,F}$, $L_{A10,1min}$, $L_{Aeq,\ 1min}$ and $L_{A90,\ 1min}$. Two sets of 15-minute measurements were obtained at each monitoring location, to understand the contribution of the road traffic noise on the ambient noise levels.

3.11 The results of the short-term attended noise monitoring are summarised below in Table 7**.**

Table 7: Summary of Attended Noise Measurements

Monitoring Location	Date	Start Time	Duration	Measured Noise Levels, dB			Observations
				$L_{Amax,\ F}$	$L_{Aeq,T}$	$L_{A90,T}$	
ST1	11/08/2020	10:00:30 11:48:05	15 Minutes 15 Minutes	66 75	53 53	45 46	Road noise and hedge cutting Road noise and residents talking
ST2		10:16:55 12:04:25	15 Minutes 15 Minutes	57 61	45 46	40 39	Road noise Road noise and electric saw in residents garden to the back of the development.
ST3		10:37:00 12:21:22	15 Minutes 15 Minutes	77 74	64 62	52 50	Road noise Road noise
ST4		10:55:29 12:39:10	15 Minutes 15 Minutes	75 78	64 64	54 55	Road noise Road noise
ST5		11:12:03 12:39:10	15 Minutes 15 Minutes	61 78	49 64	44 55	Road noise and residents talking in adjacent block Road noise

Noise Prediction Model

3.12 A computer generated model of noise propagation has been constructed using SoundPLAN Essential (v.4.1). This commercial software package undertakes complex calculations using acoustical ray-tracing techniques, taking into account the acoustically reflective and absorptive properties of the building elements. The environmental noise propagation from source to receiver position is calculated in accordance with the procedures defined in ISO 9613-2:1996 Attenuation of sound during propagation outdoors, part 2: General method of calculation using the following acoustic algorithm:

$$L_{ft}(DW) = L_w + D_c - A$$

Where:

$L_{ft}(DW)$ = equivalent continuous downwind octave-band sound pressure level at a receiver location, representing a worse case assessment;

L_w = octave-band sound power level of the noise source, where available, otherwise overall dB(A) level used;

D_c = directivity correction;

A = octave-band attenuation that occurs during propagation from the point sound source to the receiver. $A = A_{div} + A_{atm} + A_{gr} + A_{bar} + A_{misc}$;

A_{div} = attenuation due to geometrical divergence;

A_{atm} = attenuation due to atmospheric absorption;

A_{gr} = attenuation due to the ground effect;

A_{bar} = attenuation due to a barrier; and

A_{misc} = attenuation due to miscellaneous other effects.

3.13 The day and night-time current site noise levels derived from the baseline monitoring survey results have been used to calibrate the road sources used in the noise prediction model, with the site in its undeveloped form. The proposed development subject to this assessment has then been constructed in the model. This has then been used to predict road traffic noise levels at selected receptor locations. The receptor locations are identified in Figure 6.

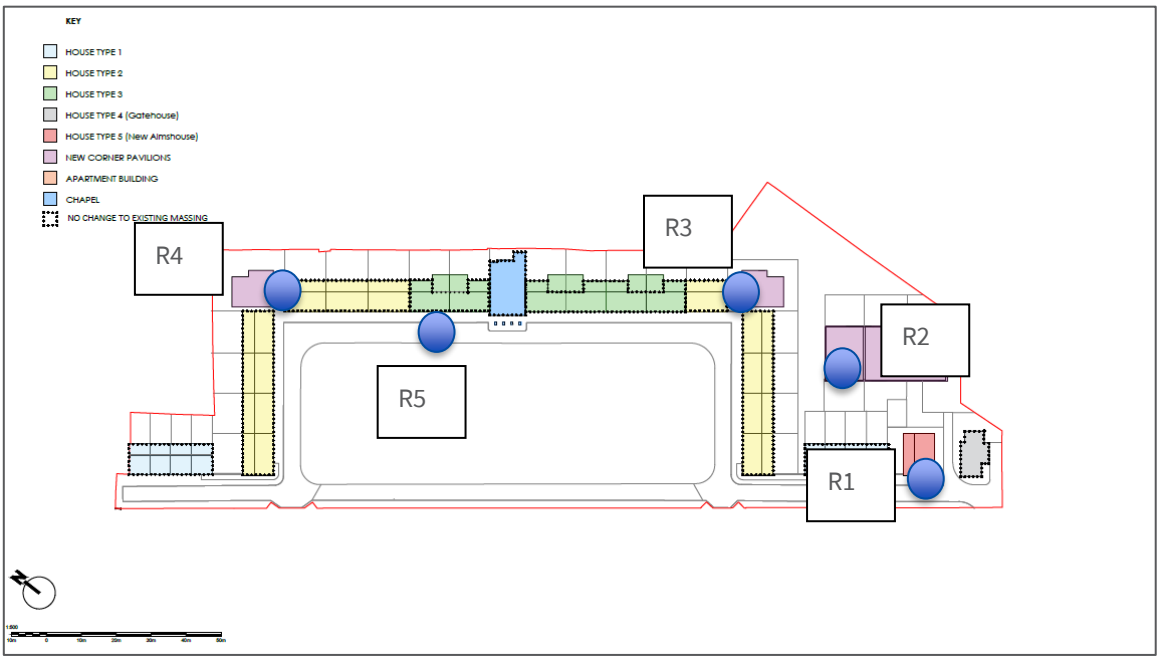


Figure 6: Mark-up of Receptor Layout; (QRP Document Draft; d+b Studios; 2022)

3.14 The following assumptions have been considered in the computer model:

> Ground cover has been modelled as hard ground;

> Receivers have been modelled at a height of 1.5 m above local ground, with upper floor repeats at intervals of 3 m;

> Buildings and any solid barriers, such as walls and fences, are modelled as reflective acoustic screens.

3.15 Taking the typical sound reduction performance into consideration, internal noise levels have been predicted inside the dwellings. Calculations have been undertaken with windows partially open and with windows fully closed, to understand the difference that this will make in terms of noise ingress into the dwellings. Worst-case façade levels and the expected internal noise levels for daytime and night time periods at a number of locations as shown in Figure 6 above. The results are presented in Table 8 and Table 9.

Table 8: Summary of Estimated Daytime Internal Noise Levels

Receptor	Predicted Daytime Façade Noise Level $L_{Aeq,16hr}$	ProPG Risk Level	Predicted Daytime Internal Noise Level, dB $L_{Aeq,16hr}$	
			Windows Partially Open	Windows Closed
R1	62	Medium	47	37
R2	45	Negligable	30	20
R3	47	Negligable	32	22
R4	48	Negligable	33	23
R5	54	Low	21	29

Notes: - assuming a 15dB(A) reduction for windows partially open
- assuming a 25dB(A) reduction for windows closed
- red text indicates an exceedance of the desirable internal noise criteria

Table 9: Summary of Estimated Night Time Internal Noise Levels

Receptor	Predicted Night-Time Façade Noise Level $L_{Aeq,8hr}$	ProPG Risk Level	Predicted Night-Time Internal Noise Level, dB $L_{Aeq,8hr}$	
			Windows Partially Open	Windows Closed
R1	60	High	45	35
R2	42	Low	27	17
R3	44	Low	29	19
R4	45	Low	30	20
R5	51	Low	36	26

Notes: - assuming a 15dB(A) reduction for windows partially open
- assuming a 25dB(A) reduction for windows closed
- red text indicates an exceedance of the desirable internal noise criteria

3.16 The results of the unattended noise measurement from LT1 show ambient daytime sound levels of 67 dB $L_{Aeq,16hr}$.The night-time sound level measured 64 dB $L_{Aeq,\ 8hr}$.

Overall Risk Assessment

3.17 The ProPG risk assessment category for the site is 'medium' for the daytime and 'high' for night-time periods at the dwellings closest to Bruce Grove. For the remainder of the development the levels are either low or negligible. With the exception of one property, all the new development is at the rear of the site where the noise levels are low or negligible.

3.18 ProPG recommends that for a Medium risk site, '*As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse*

impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development'.

3.19 ProPG recommends that for a High risk Site, '*High noise levels indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed ADS. Applicants are strongly advised to seek expert advice.*'

4. ACOUSTIC DESIGN ASSESSMENT

Overview of the Process

4.1 ProPG sets out four elements which form Stage 2 of the approach:

> **Element 1** – Good Acoustic Design Process

> **Element 2** – Internal Noise Level Guidelines

> **Element 3** – External Amenity Area Noise Assessment

> **Element 4** – Assessment of other relevant issues

4.2 These four elements are considered in turn in the following sections.

Element 1 - Good Acoustic Design Process

4.3 The ProPG states that, for sites with high noise levels, "High noise levels indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed ADS. Applicants are strongly advised to seek expert advice."

4.4 ProPG also provides a guide to the typical matters that should be considered in an Acoustic Design Statement (ADS) for a High noise risk site. Those matters have been considered this report where appropriate.

4.5 In practice, the objective is to design the building envelope to reduce internal noise from road traffic noise sufficiently to meet the BS8233/WHO guidelines by using the 'in-principle' noise control measures discussed below.

General Principles of Acoustic Design

4.6 The noise levels at the site can be controlled with suitable sound-insulating facades, including glazing and trickle ventilation.

Noise Barrier

4.7 A noise barrier around the site is not required for acoustic purposes. However, to aid the design to achieve the lowest practicable levels in the garden a high quality, dimensionally stable noise barrier should be erected around the gardens. An acoustic barrier would typically be a close boarded fence with no holes or gaps either in the fence or underneath, with a minimum mass per unit areas of at least 10kg/m^2.

4.8 We expect that the recommended BS8233 internal ambient noise levels could be met in all rooms with appropriate glazing and ventilation specifications.

Ventilation Strategy

4.9 Calculations have been based on a ventilation design strategy of 'hit and miss' trickle ventilation. Internal noise levels should be achieved with windows closed and 'hit and miss' trickle ventilation.

Element 2 – Internal Noise Level Guidelines

4.10 The second element of the ADS is to consider whether/how the ProPG internal noise criteria can be met.

4.11 Windows and unattenuated ventilators are normally the weakest areas of sound insulation of a conventional masonry façade. Opening windows for ventilation will further reduce the effective sound insulation. Regardless of the quality of window or sound insulation of the glazing, the overall insulation of an open window will be limited to 15 dB(A). A scheme to protect the occupants from external noise would therefore typically comprise an appropriate specification of double-glazed windows, acoustic trickle ventilators or attenuated through-wall ventilators to provide background and/or rapid ventilation as necessary to avoid the need to open windows.

4.12 Internal noise levels have been estimated using the measured noise levels obtained from the unattended monitoring, presented in Table 10, and assuming open windows. The estimated noise levels have been calculated by subtracting 15 dB from the measured noise levels.

Table 10: Indicative Internal Noise Levels with Open Windows and the ProPG Criteria – Receptor 1

Room	Activity	Estimated Level	ProPG Criterion (noise Index)	Comparison with ProPG
Daytime				
Resting	Living Room	47 dB L_{Aeq}	35 dB L_{Aeq}	12 dB Above
Dining	Dining Room/Area	47 dB L_{Aeq}	40 dB L_{Aeq}	7 dB Above
Bedroom	Daytime resting	47 dB L_{Aeq}	35 dB L_{Aeq}	12 dB Above
Night Time				
Bedroom	Sleeping	45 dB L_{Aeq}	30 dB L_{Aeq}	15 dB Above
Bedroom	Sleeping	51 dB L_{AFmax}	45 dB L_{AFmax}	6 dB Above

4.13 Table 10 shows that for the highest noise levels measured the estimated internal $L_{Aeq,T}$ levels for dwellings closest to Bruce Grove are all above the relevant ProPG criterion during the day and night time with windows open.

4.14 The estimated internal night time L_{AFmax} levels are achieved with windows closed but are exceeded by 11dB with windows open.

4.15 All other facades which do not look directly onto Bruce Grove meet the criteria during the daytime criteria but exceed the night time criteria. Details on all receptor locations can be seen in Appendix E.

External Building Fabric Design

4.16 Based on the assumed typical façade reductions, the noise predictions show that internal noise levels will meet the daytime criteria of 35 dB L_{Aeq}, 16hr and the night time criteria of 30 dB L_{Aeq}, 8hr at all receptors with closed windows, assuming a typical sound reduction for double glazed windows of 25dB R_w with the exception of the facades facing Bruce Grove as shown in Figure 6 below.

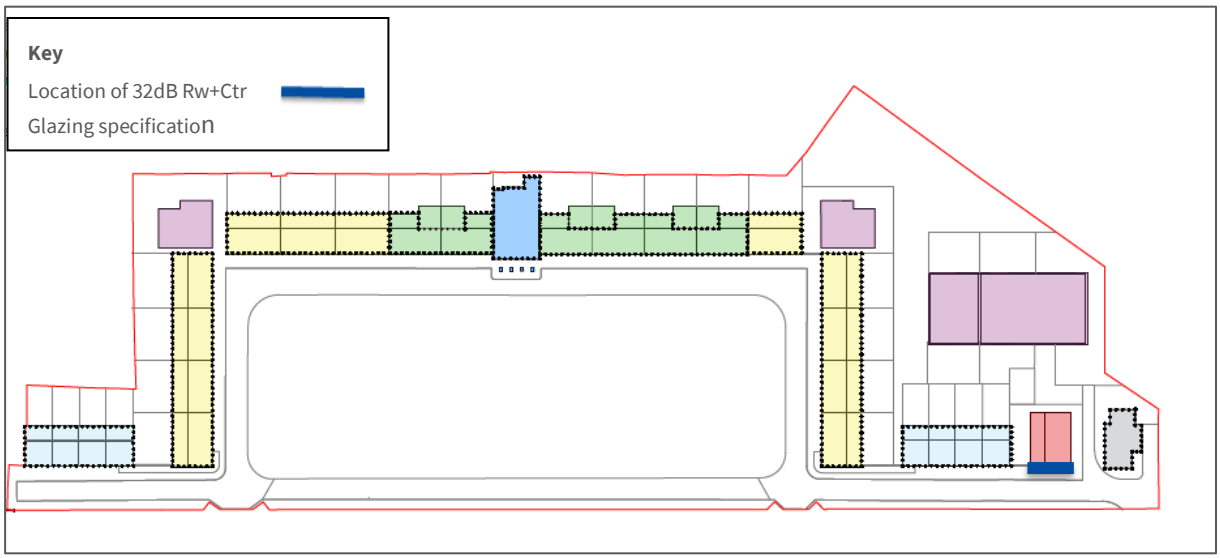


Figure 7: Location of Glazing specification for 32dB Rw+Ctr (QRP Document Draft; d+b Studios; 2022)

4.17 With windows partially open for ventilation, the daytime 35 dB L_{Aeq}, 16hr and night time 30 dB L_{Aeq}, 8hr criterion is met with the exception of the facades closest to Bruce Grove (R1).

4.18 The $L_{Amax,F}$ noise levels measured during the night time periods of the unattended monitoring have also been assessed.

4.19 WHO guideline noise criteria set an internal sleep disturbance noise limit of 45 dB $L_{Amax,F}$ at night for the onset of critical health effects, which is a level which should not be exceeded on a regular basis. Table 11: Predicted Internal L_{Amax} Levels. Table 11 presents the assessment of these criteria.

Table 11: Predicted Internal L_{Amax} Levels

Location	Typical External Façade Noise Levels	Estimated L_{Amax} Internal Noise Level		WHO Internal L_{Amax} Noise Criterion Achieved	
		Windows Partially Open	Windows Closed	Windows Partially Open	Windows Closed
				Bedroom	Bedroom
R1	77	51	47	N	N
R2	60	57	30	N	Y
R3	62	66	32	N	Y
R4	63	67	33	N	Y
R5	69	60	39	N	Y

4.20 The results show that the facades facing Bruce Grove exceed the night time L_{AMax} criteria by 2dB.

4.21 We would recommend specifying glazing with a sound reduction of 32dB R_w+C_{tr} to meet the internal noise level criteria. The locations of the facades this applies to can be seen in Figure 7.

4.22 All other facades would meet the criteria specifying glazing with a sound reduction of 25dB $R_w+C_{tr.}$

4.23 We expect that the internal criteria set out in ProPG can be achieved by way of closed but openable windows with the following specifications:

> Standard (6mm/6mm/10mm) double glazing for habitable rooms and 'hit and miss' trickle ventilation to all dwellings facing Bruce Grove; and

> Standard (4mm/6mm/4mm) double glazing for habitable rooms and trickle ventilation to all other facades.

4.24 The glazing assessment has been based on the measured day time and night-time noise levels, as presented in Table 10.

4.25 When assessing the sound insulation performance of an external building fabric system, it is generally regarded that the glazing element is the weakest path for external noise intrusion into internal areas. It is assumed that the non-glazed areas of any façade systems may incorporate sufficient acoustic treatment behind such that the glazing remains the weakest path for external noise intrusion. As such, the acoustic performance of the glazing will be the most critical element in determining the overall sound insulation performance of the external façade.

4.26 Typical glazing configurations are quoted for guidance only and alternatives may be utilised, in any case, acoustic performance of the system proposed must be demonstrated to the satisfaction of the acoustic consultant. The sound reduction performance quoted above must be achieved by the glazing system taken as a whole in its installed condition. The specification, therefore, applies to the glazing, the frames and all seals on any openable parts of the systems and any required ventilation or condensation control mechanisms. This list is not exhaustive: no part of the glazing system shall cause the above figures not to be achieved.

4.27 On the basis that the glazing achieves the above sound insulation performance, internal noise levels should be achieved with windows closed. As stated previously, if partially open windows are relied upon for background ventilation, the insulation would be reduced to approximately 15 dB, resulting in the internal daytime ambient noise being achieved but the night time max levels are exceeded. However, windows may still be openable for rapid or purge ventilation, or at the occupant's choice.

4.28 Detailed noise calculations which consider the suitability of the specified façade construction elements, including glazing and passive ventilators, for the protection against the ingress of external noise into habitable rooms should be carried out when the detailed design is complete.

Element 3 – External Amenity Area Noise Assessment

4.29 The unmitigated noise levels in the amenity areas at the rear of the property will be well shielded from Bruce Grove, by the envelope of the building. As a result, it would be expected that the unmitigated noise levels in the amenity areas would be approximately 55 dB $L_{Aeq,16h}$ during the daytime hours, which meets the guidance stated in BS 82333:2014 guidelines of 55 dB $L_{Aeq,T}$ for external areas.

4.30 The unmitigated noise levels on Bruce Grove have been measured at 60 dB $L_{Aeq,16h.}$ The amenity areas at the front of the property are shielded from the road by thick shrubs which will help to reduce the noise levels to the guideline level of 55 dB $L_{Aeq,16h.}$

Element 4 – Assessment of other relevant issues

4.31 This section considers the 'Other Relevant Issues' listed under this heading in the ProPG document.

4(i) Compliance with relevant national and local policy

Local policy in respect of noise supports the aims of the NPPF and so adopting the approach set out in the ProPG guidance will not conflict with those aims.

4(ii) Magnitude and extent of compliance with ProPG

The degree of compliance with the ProPG criteria has been addressed in this report.

4(iii) Likely occupants of the development

The design of the house leads to good acoustic conditions internally. The outdoor space is ample and would be seen as desirable to a lot of households.

4(iv) Acoustic design versus unintended adverse consequences

ProPG states, 'Design measures taken to reduce intrusion by noise may have unintended adverse consequences for the building or the nearby environment and may affect the attractiveness of the living environment for the occupants.'

The windows will be openable for rapid or purge ventilation, or at the occupant's choice, which will aid the personal control over the internal environment. If the scheme changes any unintended adverse effects arising from the design choices can be taken into account as the scheme emerges.

4(v) Acoustic design versus wider planning objectives

There is no known conflict between the acoustic design of the site and the wider planning objectives. If the development changes and then the interaction of acoustic design with other amenity considerations can be addressed

5. CONCLUSIONS

5.1 This report details the methodology and findings of an assessment of the noise impact on the proposed development at Edmansons Close within the London Borough of Haringey, and considers the suitability of the site for residential purposes.

5.2 Unattended noise measurements were undertaken to ascertain the noise levels from the proposed site. This data has been used to assess the internal noise levels at sensitive receptors located at the proposed development.

5.3 The main noise source to the site is local traffic from Bruce Grove. With the exception of the single new almshouse, all the new build elements and the six almshouses which are extended are all at the rear of the site where the noise levels are low or negligible.

5.4 The proposed scheme includes new dwellings and extensions on the existing dwellings. The criteria is based on new dwellings only but it would be acceptable for the extensions to follow the same methodology.

5.5 This report follows the ProPG method of assessment.

5.6 The results have indicated that based on the selected building elements for the scheme, the internal noise levels are predicted to achieve the daytime and night time criteria of 35 and 30dB $L_{Aeq,T}$ respectively.

5.7 The proposed scheme will incorporate the following to ensure adequate background ventilation and allow windows to be kept closed to achieve desirable internal noise levels:

> Standard (6mm/6mm/10mm) double glazing for habitable rooms and trickle ventilation to facades facing Bruce Grove.

> Standard (4mm/6mm/4mm) double glazing for habitable rooms and trickle ventilation to all other facades.

5.8 We have provided an Acoustic Design Statement at an appropriate level of detail for an application to demonstrate how design measures and other relevant matters can be applied in the development of a small scheme.

5.9 By following the recommendations in this acoustic design statement, it is expected that no significant effects will be observed.

5.10 Based on the above-mentioned findings, the report has demonstrated that the development is suitable for residential purposes.

REFERENCES

> ProPG: Planning & Noise; New Residential Developments; 2017

> Department for Environment, Food and Rural Affairs (DEFRA). Noise Policy Statement for England (NPSE), 2010.

> Department of Communities and Local Government. *National Planning Policy Framework*, 2018.

> *BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings.*

> World Health Organisation. *Guidelines for Community Noise*. 1999.

> London Borough of Haringey; Local Plan; 2017

HODKINSON

APPENDICES

APPENDIX A
Glossary of Acoustic Terms

APPENDIX B
Existing Site Layout

APPENDIX C
Time History of Unattended Noise Monitoring

APPENDIX D
Proposed Site Layout

APPENDIX E
Indicative Internal Noise Levels with Open Windows

Appendix A

Glossary of Acoustic Terms

Noise

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dBA weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dBA is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dBA. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dBA corresponds to a doubling/ halving in perceived loudness. Noise is measured on a logarithmic scale in decibels (dB) because of the ears' sensitivity to a wide range of pressure changes. The sound pressure level (SPL) of a signal is denoted by the symbol L_p and defined by the equation $L_p = 10 \log (p/p_o)^2$ where p is the root mean square pressure of the signal and p_o is the reference sound pressure (2×10^{-5} Pa).

An indication of the range of sound pressure levels commonly found in the environment is given below:

Location	L_{pA}dB(A)
Normal threshold of hearing	-10 to 20
Music halls and theatres	20 to 30
Living rooms and offices	30 to 50
Inside motor vehicles	50 to 70
Industrial premises	70 to 100
Burglar alarms at 1 m	100 to 110
Jet aircraft on take-off	110 to 130
Threshold of pain	130 to 140

External noise levels are rarely steady, but rise and fall according to activities within an area. In attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

i) The L_{Amax} noise level

This is the maximum noise level recorded over the measurement period.

ii) The L_{Aeq} noise level

This is “equivalent continuous A-weighted sound pressure level, in decibels” and is defined in British Standard BS 7445 [2] as the “ value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time internal, T, has the same mean square sound pressure as a sound under consideration whose level varies with time”.

It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

iii) The L_{A10} noise level

This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

iv) The L_{A90} noise level

This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.

Community response to environmental noise sources is dependent on both acoustic and non-acoustic factors. The acoustic factors include absolute noise level, changes or exceedances of background and ambient levels as well as the characteristics, time, duration and frequency of noise.

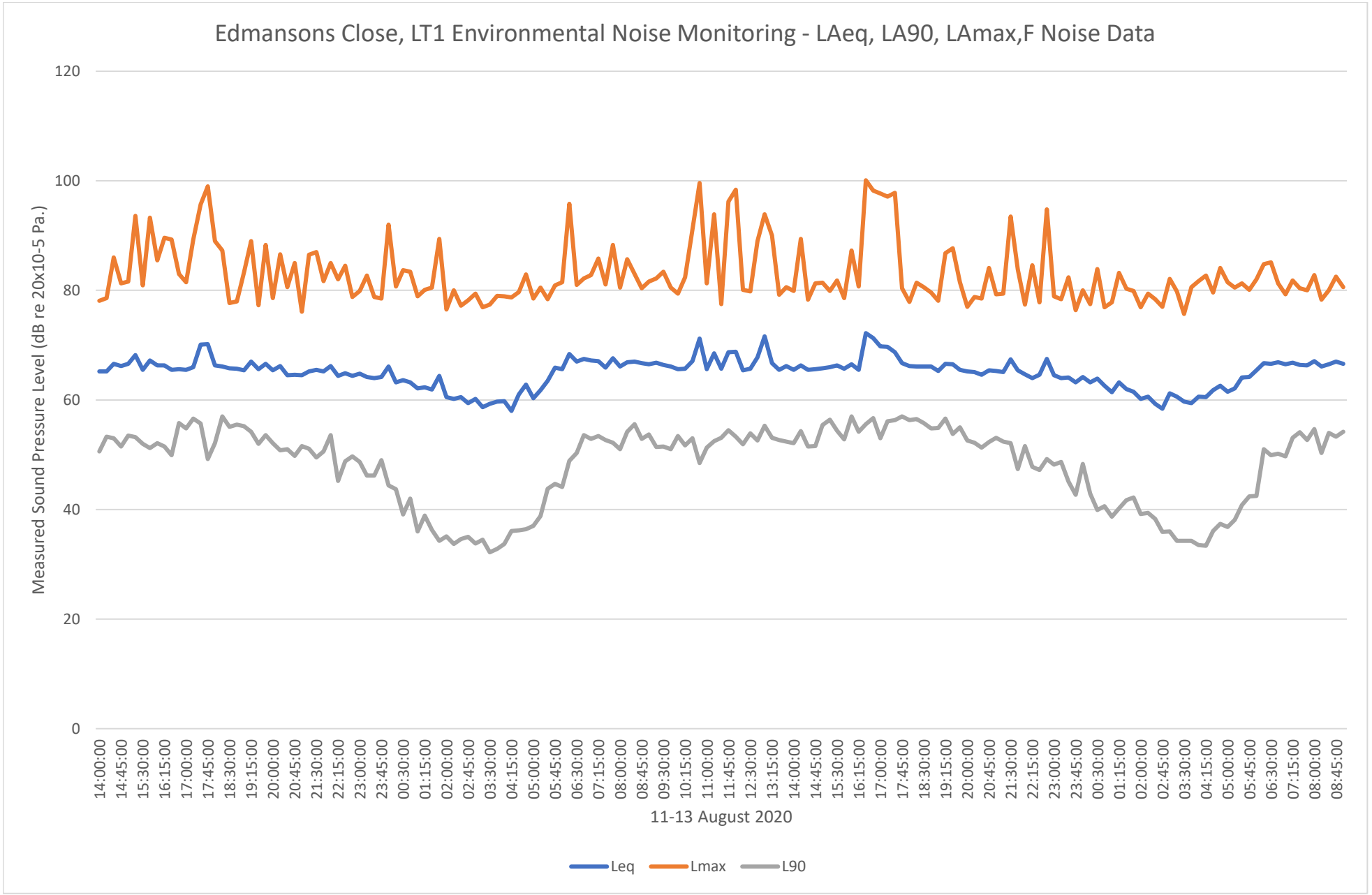
Appendix B

Existing Site


BRUCE GROVE
Linley road
Radley road
Harthham rd

Appendix C

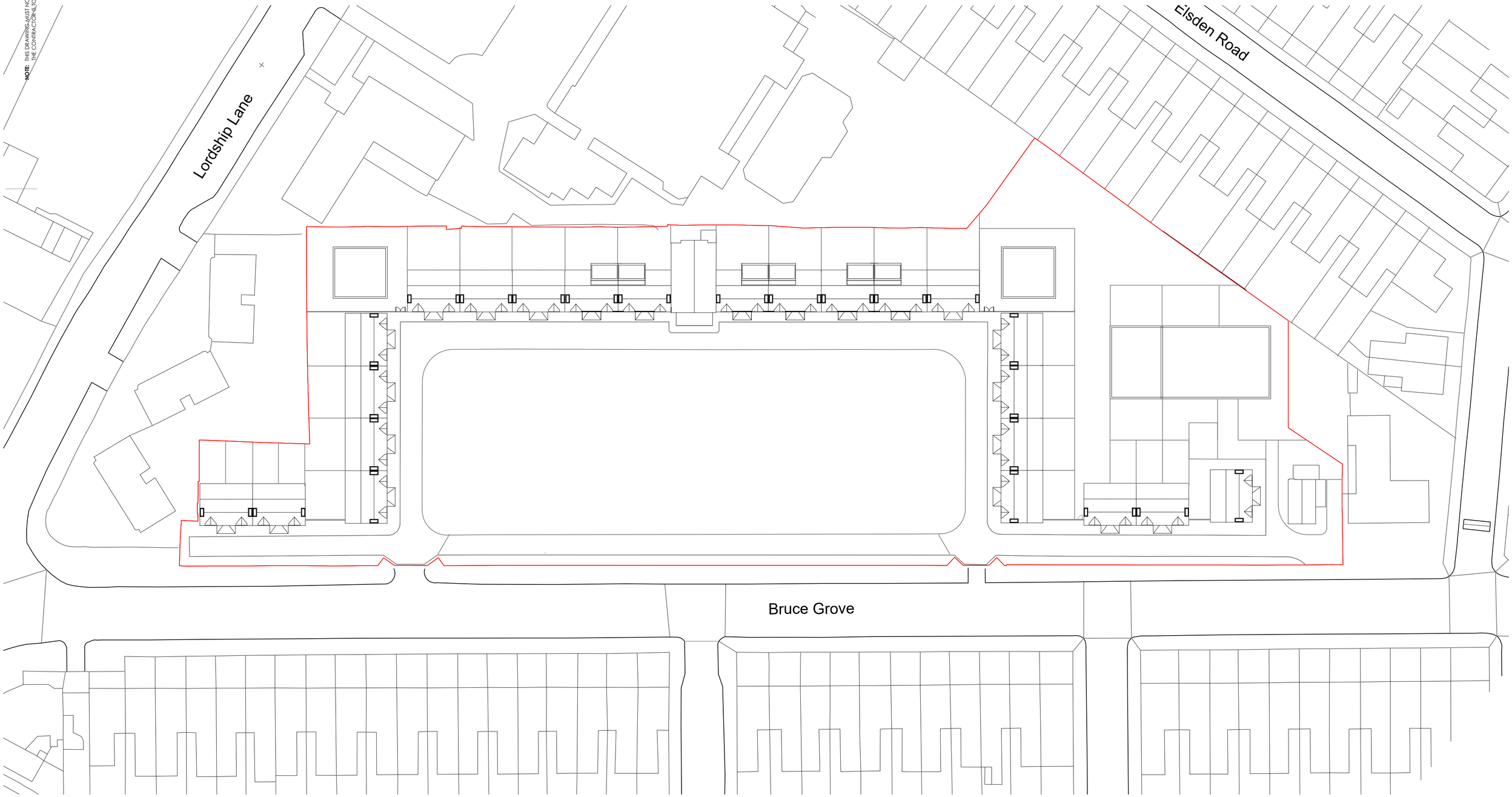
Time History of Unattended Noise Monitoring


Edmansons Close, LT1 Environmental Noise Monitoring - LAeq, LA90, LAmax,F Noise Data
Measured Sound Pressure Level (dB re 20x10-5 Pa.)
120
100
80
60
40
20
0
14:00:00
14:45:00
15:30:00
16:15:00
17:00:00
17:45:00
18:30:00
19:15:00
20:00:00
20:45:00
21:30:00
22:15:00
23:00:00
23:45:00
00:30:00
01:15:00
02:00:00
02:45:00
03:30:00
04:15:00
05:00:00
05:45:00
06:30:00
07:15:00
08:00:00
08:45:00
09:30:00
10:15:00
11:00:00
11:45:00
12:30:00
13:15:00
14:00:00
14:45:00
15:30:00
16:15:00
17:00:00
17:45:00
18:30:00
19:15:00
20:00:00
20:45:00
21:30:00
22:15:00
23:00:00
23:45:00
00:30:00
01:15:00
02:00:00
02:45:00
03:30:00
04:15:00
05:00:00
05:45:00
06:30:00
07:15:00
08:00:00
08:45:00
11-13 August 2020
Leq
Lmax
L90

Appendix D

Proposed Site Layout

NOTE: THIS DRAWING MUST NOT BE SCALED.
THE CONTRACTOR TO CHECK ALL DIMENSIONS ON SITE



1:500

10m 0 10m 20m 30m 40m 50m

PROJECT

Edmanson's Close
Bruce Grove
Haringey

CLIENT

The Drapers'

DRAWING ORIGINATOR

d+b studios
85 HOLMESDALE ROAD
TEDDINGTON TW11 9LQ

+44 (0) 7810 481 900
www.dplusbstudios.com

DRAWING TITLE

BLOCK PLAN
Proposed

JOB NO	SCALE	DRAWN BY	ISSUE DATE	REVISION
db-001	1:500 @ A2	PD	2022	00
DRAWING STATUS		CHECKED BY	PAPER SIZE	
PLANNING		PD	A2	

PROJECT CODE	COMPANY CODE	DOC. CODE	PACKAGE NO CODE	LEVEL	ZONE / SUBZONE	SUB ZONE	DRAWING NUMBER
EC	d+b	P	XXX	00	XX	XXX	031

Appendix E

Indicative Internal Noise Levels with Open Windows

Indicative Internal Noise Levels with Open Windows and the ProPG Criteria - Receptor 1

Room	Activity	Estimated Level	ProPG Criterion (noise Index)	Comparison with ProPG
Daytime				
Resting	Living Room	47 dB L_{Aeq}	35 dB L_{Aeq}	12 dB Above
Dining	Dining Room/Area	47 dB L_{Aeq}	40 dB L_{Aeq}	7 dB Above
Bedroom	Daytime resting	47 dB L_{Aeq}	35 dB L_{Aeq}	12 dB Above
Night Time				
Bedroom	Sleeping	45 dB L_{Aeq}	30 dB L_{Aeq}	15 dB Above
Bedroom	Sleeping	51 dB L_{AFmax}	45 dB L_{AFmax}	6 dB Above

Indicative Internal Noise Levels with Open Windows and the ProPG Criteria - Receptor 2

Room	Activity	Estimated Level	ProPG Criterion (noise Index)	Comparison with ProPG
Daytime				
Resting	Living Room	30 dB L_{Aeq}	35 dB L_{Aeq}	12 dB Above
Dining	Dining Room/Area	30 dB L_{Aeq}	40 dB L_{Aeq}	7 dB Above
Bedroom	Daytime resting	30 dB L_{Aeq}	35 dB L_{Aeq}	12 dB Above
Night Time				
Bedroom	Sleeping	27 dB L_{Aeq}	30 dB L_{Aeq}	15 dB Above
Bedroom	Sleeping	57 dB L_{AFmax}	45 dB L_{AFmax}	12 dB Above

Indicative Internal Noise Levels with Open Windows and the ProPG Criteria - Receptor 3

Room	Activity	Estimated Level	ProPG Criterion (noise Index)	Comparison with ProPG
Daytime				
Resting	Living Room	32 dB L_{Aeq}	35 dB L_{Aeq}	12 dB Above
Dining	Dining Room/Area	32 dB L_{Aeq}	40 dB L_{Aeq}	7 dB Above
Bedroom	Daytime resting	32 dB L_{Aeq}	35 dB L_{Aeq}	12 dB Above
Night Time				
Bedroom	Sleeping	29 dB L_{Aeq}	30 dB L_{Aeq}	1 dB Below
Bedroom	Sleeping	66 dB L_{AFmax}	45 dB L_{AFmax}	21 dB Above

Indicative Internal Noise Levels with Open Windows and the ProPG Criteria - Receptor 4

Room	Activity	Estimated Level	ProPG Criterion (noise Index)	Comparison with ProPG
Daytime				
Resting	Living Room	33 dB L_{Aeq}	35 dB L_{Aeq}	2 dB Below
Dining	Dining Room/Area	33 dB L_{Aeq}	40 dB L_{Aeq}	7 dB Below
Bedroom	Daytime resting	33 dB L_{Aeq}	35 dB L_{Aeq}	2 dB Below
Night Time				
Bedroom	Sleeping	30 dB L_{Aeq}	30 dB L_{Aeq}	Equal
Bedroom	Sleeping	67 dB L_{AFmax}	45 dB L_{AFmax}	22 dB Above

Indicative Internal Noise Levels with Open Windows and the ProPG Criteria - Receptor 5

Room	Activity	Estimated Level	ProPG Criterion (noise Index)	Comparison with ProPG
Daytime				
Resting	Living Room	21 dB L_{Aeq}	35 dB L_{Aeq}	14 dB Below
Dining	Dining Room/Area	21 dB L_{Aeq}	40 dB L_{Aeq}	19 dB Below
Bedroom	Daytime resting	21 dB L_{Aeq}	35 dB L_{Aeq}	14 dB Below
Night Time				
Bedroom	Sleeping	36 dB L_{Aeq}	30 dB L_{Aeq}	6 dB Above
Bedroom	Sleeping	60 dB L_{AFmax}	45 dB L_{AFmax}	15 dB Above