REPORT REFERENCE:

SA – 7370-3

ENVIRONMENTAL NOISE IMPACT ASSESSMENT

PRoPG Planning and Noise

British Standard 8233: 2014

World Health Organisation (WHO)

CLIENT:

Komfort Services

SITE:

Land next to Little Elms

High Street

Harlington

Hayes

UB3 5EE

SURVEY DATES:

23rd – 27th February 2023

Report By

Mr. B. J. Scrivener MIOA.

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1 EXECUTIVE SUMMARY

1.1 Instruction

Sound Advice Acoustics Ltd have been instructed by Komfort Services to undertake a background noise survey to British Standard 8233: 2014 to determine the impact of existing noise sources on the proposed accommodation scheme at Land next to Little Elms, High Street, Harlington, Hayes, UB3 5EE.

1.2 Scope of Report

The measurements will be undertaken in accordance with ISO 1996 – Part 2: 2017 to determine the existing background noise levels and British Standard 8233: 2014 will be used to determine the impact of existing traffic on the internal noise environment within the proposed residential dwellings. This report aims to establish the following:

- Existing background noise levels within the area;
- Assess the potential internal noise levels on the proposed rooms;
- Provide specifications for the ventilation and window glazing with the proposed rooms.

1.3 Summary of Results

1.3.1 Background Noise Levels

A 96 hour background noise survey was undertaken from 23rd – 27th February 2023 at two positions on the site in order to establish the underlying background noise levels. The recorded levels are as follow: -

Assessment Position	Date Start	Date Finish	Daytime LAeq	Night time LAeq
Position 1	23/02/2023	27/02/2023	59.8	55.7
Position 2	23/02/2023	27/02/2023	59.0	50.8

1.4 Potential Façade Noise Levels

1.4.1 Daytime (07:00-23:00)

Time Period	Highest Potential Façade Noise Level	Noise Risk Category 1 - Low
Average Daytime (07:00-23:00)	$L_{Aeq,\ 16\ HOUR}$ 60 dB	50 - 63 dB

1.4.2 Night Time (23:00-07:00)

Time Period	Highest Potential Façade Noise Level	Noise Risk Category 1 - Low
Average Night Time (23:00-07:00)	$L_{Aeq,\ 16\ HOUR}$ 52 dB	40 – 55 dB
	Maximum (10 Times) – L_{Amax} 64.3 dB	>80 dB (10 Times in 8 Hours)

1.5 Risk Assessment

1.5.1 Daytime (07:00-23:00) – Position 1

Risk Assessment Category	Risk Assessment
1 – Low	At low noise levels, the site is likely to be acceptable from a noise perspective provided that 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 in the finished development.

1.5.2 Night Time (23:00-07:00) – Position 1

Risk Assessment Category	Risk Assessment
1 – Low	At low noise levels, the site is likely to be acceptable from a noise perspective provided that 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 in the finished development.

The above table demonstrates this site is located within Noise Risk Category 1 which suggests a low level of risk for daytime levels and Noise Risk Category 1 which suggests a low level of risk for night time levels.

1.6 Glazing & Ventilation Specification

The development should be designed with a 4mm glass / 16mm air gap / 4mm glass double glazed windows and a Titon V25 / Standard Canopy or similarly approved to all rooms to ensure the internal noise levels are acceptable in terms of the assessment to British Standard 8233: 2014. To further protect the future residents from any associated aircraft noise from Heathrow Airport to the south of the site, it is recommended to upgrade the standard top floor ceiling to 2 x 15mm soundbloc board.

1.7 WHO Guidelines for Community Noise

The development proposes external living areas and therefore an assessment to the World Health Organisation's 'Guidelines for Community Noise' has been carried out. The guideline has been considered acceptable criteria for this assessment given the sites geographical location and proximity to a major road network and airport. The calculation demonstrates the external living spaces are likely to see noise levels just above the upper guideline of 55 dB.

However, BS8233: 2014 states the following:

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

1.8 Conclusion

Levels have been recorded and assessments made in accordance with the relevant standards. Internal criteria's have been set and calculations made in order to determine the minimum construction details required in order to meet the desired level within the proposed residential dwellings and satisfy the local council's requirements.

National Planning Policy Framework 2023 suggests that planning permission should be granted unless any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in the framework taken as a whole, or specific policies in the framework indicate the application should be restricted.

Based on the calculations and assessments made within this report it is the professional opinion of Sound Advice Acoustics Ltd that the proposed development can demonstrate compliance with the National Planning Policy Framework 2023, NPPF & NPSE and that, with regards to sound, planning permission can be granted.

2 INTRODUCTION

Sound Advice Acoustics Ltd have been instructed by Komfort Services to undertake a background noise survey to British Standard 8233: 2014 to determine the impact of existing noise sources on the proposed accommodation scheme at Land next to Little Elms, High Street, Harlington, Hayes, UB3 5EE.

Heathrow airport is located approximately ½ mile to the south of the site and therefore government issued noise maps have been incorporated within our calculations and these triangulated with our own recorded data to give a true representation of the propagating sound levels across the site.

Ambient noise levels were measured between 23rd – 27th February 2023. This report by Sound Advice Acoustics Ltd gives the results of these measurements and an assessment in accordance with government planning guidelines and relevant standards together with mitigation measures as required.

With regards to external ambient noise, environmental noise levels are to be monitored at the site in accordance with British Standard 7445: 2003 'Description and measurement of environmental noise assessments and assessments made in-line with PRoPG: Planning and Noise.

2.1 Planning Practice Guidance and Noise

March 2014 saw the publication of the Planning Practice Guidance for Noise (PPG-Noise) and this was subsequently updated in December 2014. The Planning Practice Guidance and Noise sets out details of how potential noise impacts should be evaluated.

'Local planning authorities' plan-making and decision taking should take account of the acoustic environment and in doing so consider:

- *whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved.*

In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation. As noise is a complex technical issue, it may be appropriate to seek experienced specialist assistance when applying this policy.'

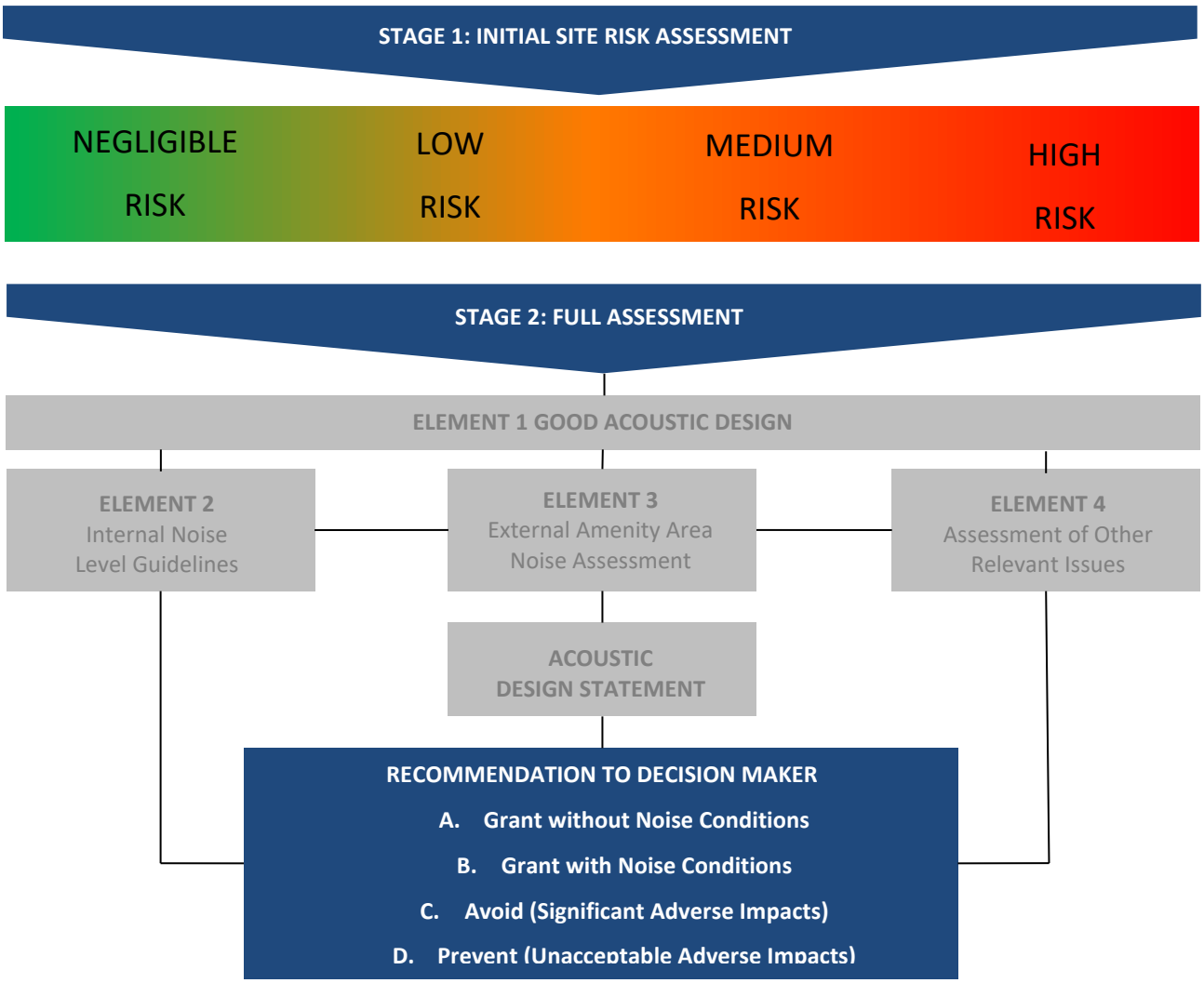
In accordance with Stage 2: Full Assessment, Other Noise Sources, detailed calculations and assessments should be carried out pertaining to these as PPG Noise does not provide advice and guidance when taking these elements into consideration.

2.1.1 Professional Practice Guidance on Planning & Noise.

The Professional Practice Guidance (PRoPG) on Planning and Noise for New Residential Development was published in May 2017 by the Association of Noise Consultants (ANC), Institute of Acoustics (IOA) and Chartered Institute of Environmental Health (CIEH). This document was developed in order to offer professional guidance on recommended strategies to the management of noise for use in the associated planning applications for specific sites. This furthermore, provides a numerical acoustic standard in accordance with the Government's planning and noise policies.

This document has been developed to ensure the developer adopts a good acoustic design process to ensure protection for future residents from the potential harmful effects from noise. The PRoPG denotes that it *'does not constitute an official government code of practice and neither replaces nor provides an authoritative interpretation of the law or government policy on which users should take their own advice as appropriate'.*

The PRoPG adopts a twin-stage approach, firstly providing an 'Initial Noise Risk Assessment' of the proposed development site before undertaking a detailed approach of a noise impact assessment. The results from the initial noise risk assessment are an indication of the general acoustic environment of the proposed development and demonstrate how detailed the noise impact assessment will need to be in order to mitigate any acoustic issues.



2.2 British Standard 8233: 2014

Calculations are to be made in accordance with BS 8233: 2014 Sound Insulation and Noise Reduction for Buildings Code of Practice.

BS 8233: 2014 set the following parameters as target levels that should be designed to within rooms such as Living Rooms and Bedrooms.

Indoor ambient noise levels in spaces when they are unoccupied and privacy is also important		
Objective	**Typical situations**	**Design Range $L_{Aeq,t}$ dB**
Typical noise levels for acoustic privacy in shared spaces	Living room	35 – 40
NOTE: See Noise control in building services [28] and BS EN ISO 3382.		

Indoor ambient noise levels for dwellings			
Activity	**Location**	**07:00 – 23:00**	**23:00 – 07:00**
Resting	Living Room	35 dB $L_{Aeq\ 16\ HOUR}$	--
Dining	Dining Room / Area	40 dB $L_{Aeq\ 16\ HOUR}$	--
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq\ 16\ HOUR}$	30 dB $L_{Aeq\ 8\ HOUR}$

Calculations and assessments are therefore to be carried out in order to satisfy the above requirements of BS 8233: 2014.

2.3 National Planning Policy Framework 2023 (NPPF) and Noise Policy Statement for England 2010 (NPSE).

References and evaluations are to be made to the National Planning Policy Framework 2023(NPPF) and the Noise Policy Statement for England 2010 (NPSE). The purpose of this document is to include all aspects of environmental noise within assessments i.e. environmental noise, neighbour noise and neighbourhood noise. Noise is to be considered alongside other relevant issues relating to the site and should not be considered in isolation, according to the NPSE.

There are several key phrases within the NPSE aims and these are discussed below.

2.3.1 "Significant adverse" and "adverse"

There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

2.3.2 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.

2.3.3 LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.
Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

2.3.4 SOAEL – Significant Observed Adverse Effect Level

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

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.

2.4 World Health Organisation 'Guidelines for Community Noise'

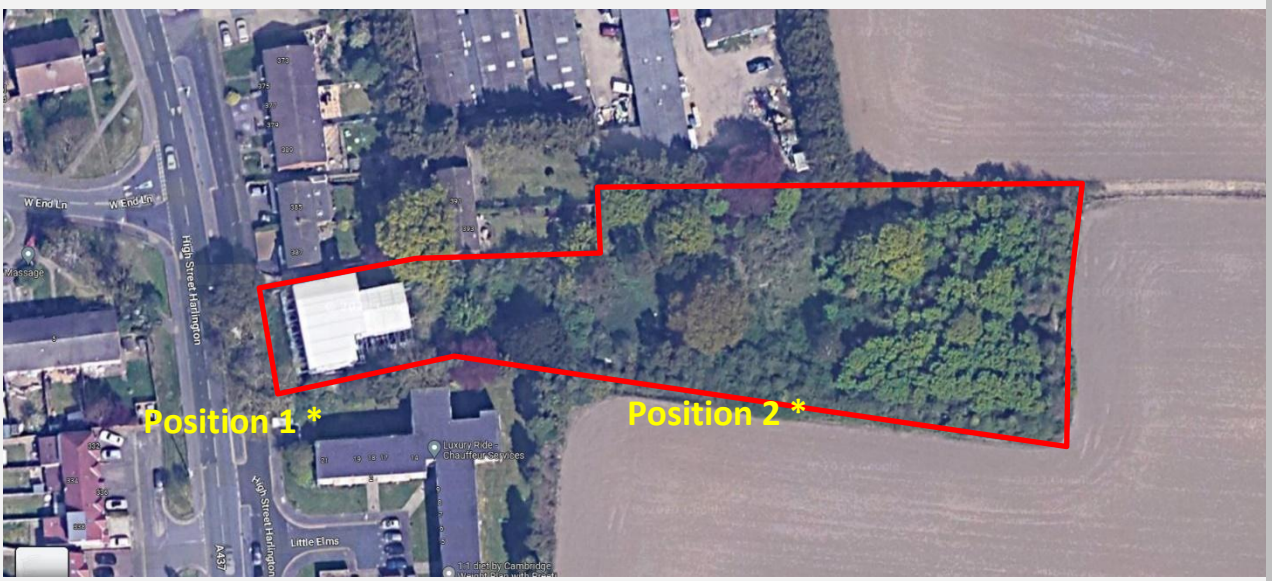
In addition, calculations are to be made for the predicted daytime noise levels within the outdoor living area and assessments made against the recommended levels within the World Health Organisation's 'Guidelines for Community Noise'. In order to evaluate these levels accurately, the 3D modelling software CADNA A is to be adopted for the purpose of this assessment.

Finally, assessments and references are to be made to the World Health Organisation Night Time Noise Guidance 2009.

3 SITE LOCATION

Position of Site in Wider Area

The site is located in Harlington, Hayes. The dominant noise source is road traffic noise.



3.1 Proposed Development

The proposed development is shown below.

Proposed Site Layout

4 PROCEDURE

External noise levels were recorded over a typical period and analysis date extrapolated between 07:00 hrs 23rd February 2023 and 07:00 hrs on 27th February 2023 at 1 position as detailed within this report.

Position 1 was located at the front of the site in order to capture the noise levels associated with the Main Road. Position 2 was located at the front of the site in order to capture the noise levels associated with the background. Sample measurements were recorded over continuous 15 minute samples and from this data the hourly LAeq daytime values have been evaluated. Sound Pressure Levels were recorded on the following setting along with a full octave band frequency analysis measured simultaneously and between 31.5 Hz and 16.0 kHz.

Daytime 07:00 – 23:00		Night Time 23:00 – 07:00	
$L_{Aeq\ 1\ HOUR}$ dB	$L_{A10\ 1\ HOUR}$ dB	$L_{Aeq\ 1\ MINUTE}$ dB	$L_{A10\ 1\ MINUTE}$ dB
$L_{AMAX\ 1\ HOUR}$ dB	$L_{A50\ 1\ HOUR}$ dB	$L_{AMAX\ 1\ MINUTE}$ dB	$L_{A50\ 1\ MINUTE}$ dB
$L_{AMIN\ 1\ HOUR}$ dB	$L_{A90\ 1\ HOUR}$ dB	$L_{AMIN\ 1\ MINUTE}$ dB	$L_{A90\ 1\ MINUTE}$ dB

Calculations have been made in accordance with BS 8233: 2014 'Sound Insulation and Reduction of Buildings - Code of Practice'. Recommendations were made for any additional acoustics measures to conform to these standards.

From the downloaded recorded results, the daytime and night time periods were assessed and used within the above calculations as $L_{Aeq\ 16\ HOUR}$ dB levels for daytime and $L_{Aeq\ 8\ HOUR}$ dB levels for night time. These are detailed within this report. All data averaged throughout the day has been done so on a logarithmic basis to give accurate $L_{Aeq\ 16\ Hour}$ dB daytime and $L_{Aeq\ 8\ Hour}$ dB night time noise levels.

Finally, it should be noted that calculations are carried out with façade levels corrected from the recorded noise levels to the calculated façade levels.

5 APPARATUS

The equipment was calibrated using a sound pressure level of 114.0 dB at an octave band centre frequency of 1000Hz with reference to 2 x 10^{-5} Nm^{-2} before and after the tests and the equipment set to have no inaccuracy greater than 0.2dB.

All the following equipment was calibrated in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service (UKAS) on the following dates. Calibration schedules are implemented within Sound Advice Acoustics Ltd in accordance with UKAS directive LAB 23.

5.1 140 noise meter s/n 1403140 environmental testing – Position 1

Description	Make	Type	Serial No.	Calibration Intervals	Last Calibrated	Next Due Calibration
Integrated Sound Level Meter	Norsonic	140	1403140	2 YEARS	06.04.2021	06.04.2023
12.5mm Microphone (with windshield)	Norsonic	1225	413206	2 YEARS	17.11.2021	17.11.2023
Microphone Pre – Amplifier	Norsonic	1209	12245	2 YEARS	06.04.2021	06.04.2023

5.2 118 noise meter s/n 31632 environmental testing – Position 2

Description	Make	Type	Serial No.	Calibration Intervals	Last Calibrated	Next Due Calibration
Integrated Sound Level Meter	Norsonic	118	31632	2 YEARS	25.07.2022	25.07.2024
12.5mm Microphone (with windshield)	Norsonic	1225	91720	2 YEARS	25.07.2022	25.07.2024
Microphone Pre – Amplifier	Norsonic	1201	29307	2 YEARS	25.07.2022	25.07.2024

Full calibration certificates are available upon request.

6 RESULTS

6.1 Downloaded results, and averages.

6.1.1 07:00 – 07:00 23rd – 24th February 2023 – Position 1

NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	59.8	85.0	52.0	64.7	56.4	59.1	59.8	54.5	47.5	40.4	37.9	18.1
NIGHT TIME 23:00 - 07:00 LA90 15 MIN & Corresponding LAeq 15 MIN	55.2	86.6	47.0	57.3	49.8	53.1	54.2	50.1	44.4	43.9	38.7	20.1

6.1.2 07:00 – 07:00 24th – 25th February 2023 – Position 1

NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	55.8	85.1	40.0	60.6	51.8	51.8	54.7	50.4	45.4	44.9	42.7	22.8
NIGHT TIME 23:00 - 07:00 LA90 15 MIN & Corresponding LAeq 15 MIN	51.9	79.6	41.0	54.3	46.0	47.1	51.0	45.9	38.8	43.8	39.7	19.2

6.1.3 07:00 – 07:00 25th – 26th February 2023 – Position 1

NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	57.6	81.4	46.0	61.0	52.7	55.0	57.2	52.0	47.4	42.9	41.1	21.0
NIGHT TIME 23:00 - 07:00 LA90 15 MIN & Corresponding LAeq 15 MIN	52.6	82.0	40.0	55.0	46.8	49.5	48.7	46.1	45.0	44.7	42.4	20.5

6.1.4 07:00 – 07:00 26th – 27th February 2023 – Position 1

NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	55.9	86.3	46.0	60.9	53.4	56.7	54.4	49.1	41.1	47.9	42.6	23.1
NIGHT TIME 23:00 - 07:00 LA90 15 MIN & Corresponding LAeq 15 MIN	55.7	85.9	47.0	62.2	53.8	57.1	55.5	50.0	40.3	38.8	37.2	17.9

6.1.5 07:00 – 07:00 23rd – 24th February 2023 – Position 2

NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	59.0	78.1	53.0	61.5	56.1	54.8	54.7	55.9	50.5	45.9	41.3	21.4
NIGHT TIME 3:00 - 07:00 LA90 15 MIN & Corresponding LAeq 15 MIN	49.3	63.9	38.0	51.7	44.7	43.2	42.8	46.2	41.4	39.0	35.0	14.1

6.1.6 07:00 – 07:00 24th – 25th February 2023 – Position 2

NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	55.9	75.8	52.0	60.9	55.3	53.0	51.4	53.1	47.3	40.1	34.7	17.2
NIGHT TIME 23:00 - 07:00 LA90 15 MIN & Corresponding LAeq 15 MIN	50.8	70.8	43.0	53.2	47.7	47.4	46.3	47.9	41.4	38.7	32.9	12.2

6.1.7 07:00 – 07:00 25th – 26th February 2023 – Position 2

NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	56.6	81.5	52.0	61.3	55.2	53.3	52.1	53.6	47.9	42.0	37.3	16.5
NIGHT TIME 23:00 - 07:00 LA90 15 MIN & Corresponding LAeq 15 MIN	48.8	66.2	39.0	51.6	45.0	43.3	42.8	45.9	40.6	37.3	32.2	11.9

6.1.8 07:00 – 07:00 26th – 27th February 2023 – Position 2

NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	55.1	76.6	51.0	60.0	54.1	51.9	50.6	52.3	46.5	38.1	32.7	16.4
NIGHT TIME 23:00 - 07:00 LA90 15 MIN & Corresponding LAeq 15 MIN	48.8	69.2	45.0	51.2	45.4	44.0	42.9	46.2	40.7	35.3	29.6	10.0

The following noise levels at position 2 have been corrected for the highest recorded façade levels and used within the BS 8233: 2014 calculations

NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	59.0	78.1	53.0	61.5	56.1	54.8	54.7	55.9	50.5	45.9	41.3	21.4
NIGHT TIME 23:00 - 07:00 A90 15 MIN & Corresponding LAeq 15 MIN	50.8	70.8	43.0	53.2	47.7	47.4	46.3	47.9	41.4	38.7	32.9	12.2

7 PRoPG PLANNING & NOISE STAGE 1

7.1 Stage 1: Initial Site Noise Risk Assessment

The Stage 1, Initial Noise Risk Assessment, compares the recorded ambient noise levels obtained from the acoustic survey and correlates these against the risk scale within the PRoPG Document in order to evaluate any potential adverse effects the site is currently exposed to with regards to noise.

The outcome of the Stage 1 assessment will determine the level of detail required within Stage 2 in order to demonstrate suitable mitigations can be introduced to ensure continuing compliance with the relevant standards, local planning policies and PRoPG.

The following table demonstrates the Initial Risk Assessment Noise Levels as detailed within PRoPG Figure.1:-

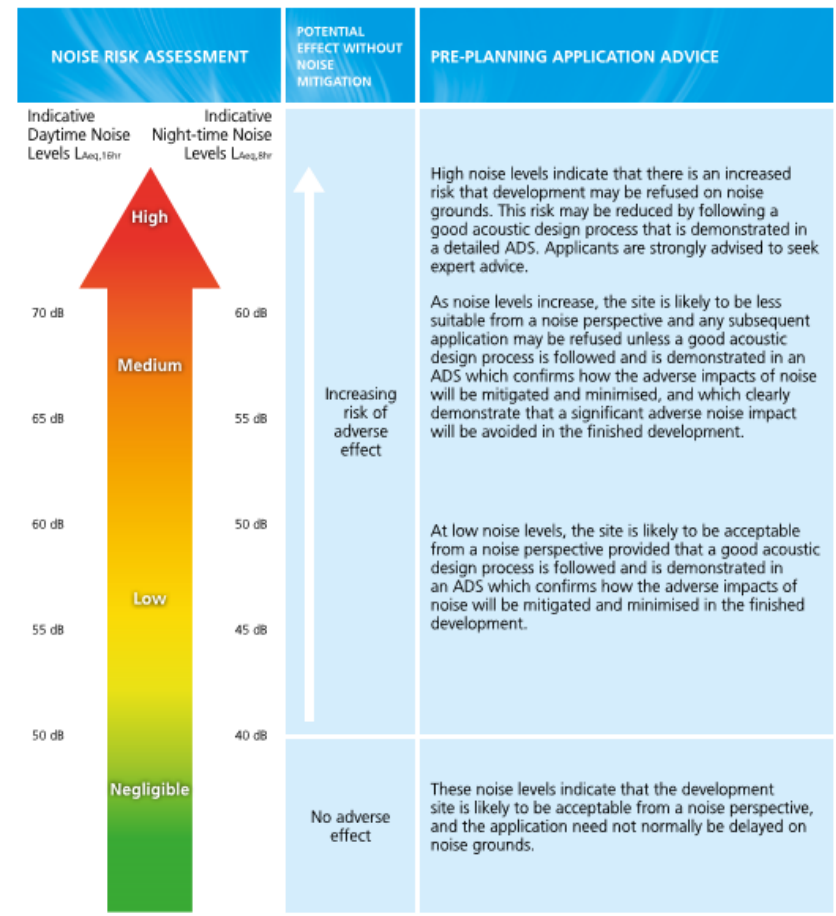


Figure 1. Stage 1– Initial Site Noise Risk Assessment

Noise Risk Category	0 – Negligible	1 – Low	2 – Medium	3 - High
Average Daytime	<50 dB	50 – 63 dB	63 – 70 dB	>70 dB
Average Night Time	<40 dB	40 – 55 dB	55 – 60 dB	>60 dB
Maximum Night Time			>80 dB (10 Times in 8 Hours)	

Based on the data collected from the aforementioned noise survey, the following PRoPG Stage 1 assessments can be made:-

7.2 Potential Façade Noise Levels

7.2.1 Daytime (07:00-23:00)

Time Period	Highest Potential Façade Noise Level	Noise Risk Category 1 - Low
Average Daytime (07:00-23:00)	$L_{Aeq,\ 16\ HOUR}$ 60 dB	50 - 63 dB

7.2.2 Night Time (23:00-07:00)

Time Period	Highest Potential Façade Noise Level	Noise Risk Category 1 - Low
Average Night Time (23:00-07:00)	$L_{Aeq,\ 16\ HOUR}$ 52 dB	40 – 55 dB
	Maximum (10 Times) – L_{Amax} 64.3 dB	>80 dB (10 Times in 8 Hours)

7.3 Risk Assessment

7.3.1 Daytime (07:00-23:00) – Position 1

Risk Assessment Category	Risk Assessment
1 – Low	At low noise levels, the site is likely to be acceptable from a noise perspective provided that 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 in the finished development.

7.3.2 Night Time (23:00-07:00) – Position 1

Risk Assessment Category	Risk Assessment
1 – Low	At low noise levels, the site is likely to be acceptable from a noise perspective provided that 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 in the finished development.

The above table demonstrates this site is located within Noise Risk Category 1 which suggests a low level of risk for daytime levels and Noise Risk Category 1 which suggests a low level of risk for night time levels.

8 PRoPG PLANNING & NOISE STAGE 2 - ELEMENT 1 – GOOD ACOUSTIC DESIGN

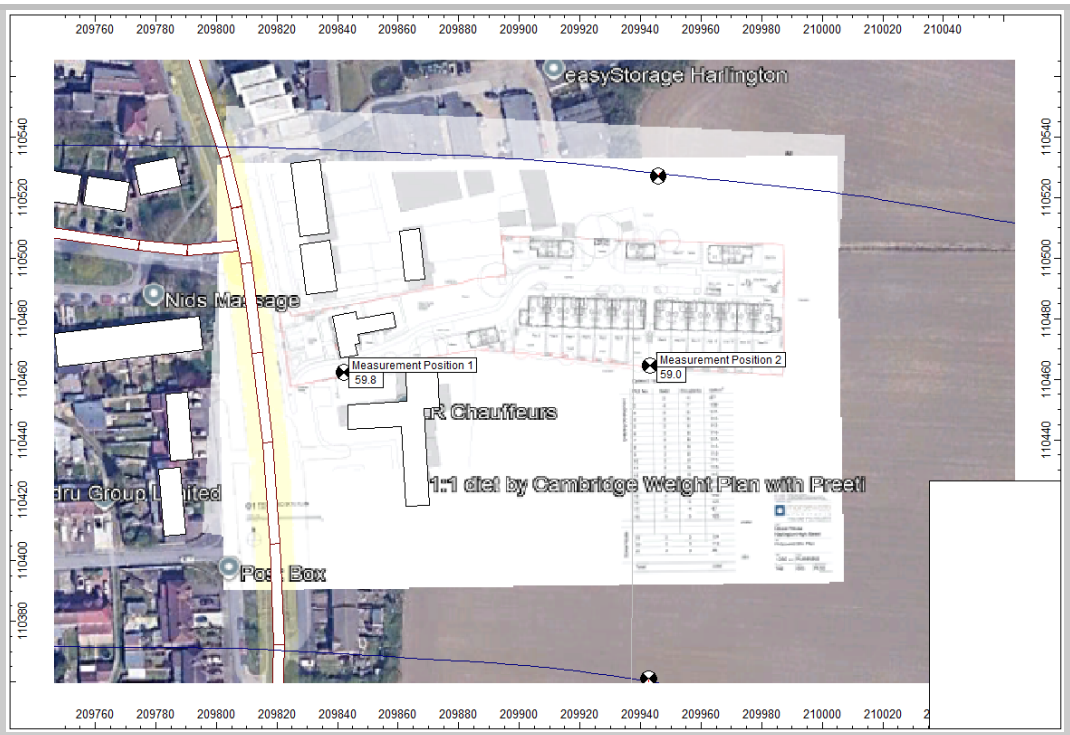
Given the size and orientation of the proposed site, it is recommended that the developer adopt, where practically possible, a good acoustic design which should include careful consideration of the positioning of the proposed properties together with thoughts being taken as to internal layouts to minimise noise sensitive rooms facing onto dominant noise sources within the local areas. Given the size of this development, every effort has already been made to minimise the acoustic impact from the surrounding areas.

9 ELEMENT 2 – INTERNAL NOISE LEVEL GUIDELINES

9.1 Discussion of Results

It can be seen from the attached graph and downloaded results that the external noise levels have followed the expected path and remained fairly constant throughout the day. The levels then gradually dropped off as the evening progressed and began to rise when morning traffic levels increased.

9.2 Existing Noise Levels – Daytime (07:00 – 23:00)

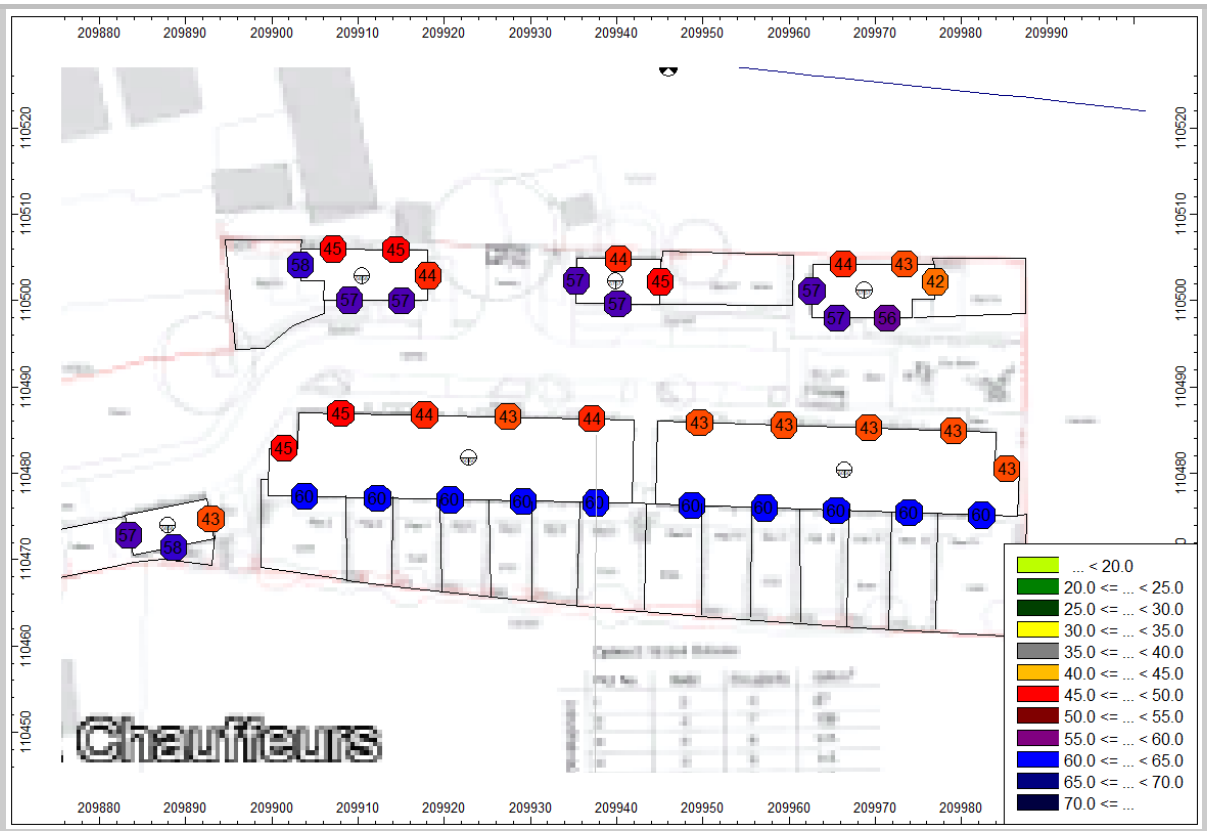


Daytime prior to development

9.3 Existing Noise Levels – Night Time (23:00 – 07:00)

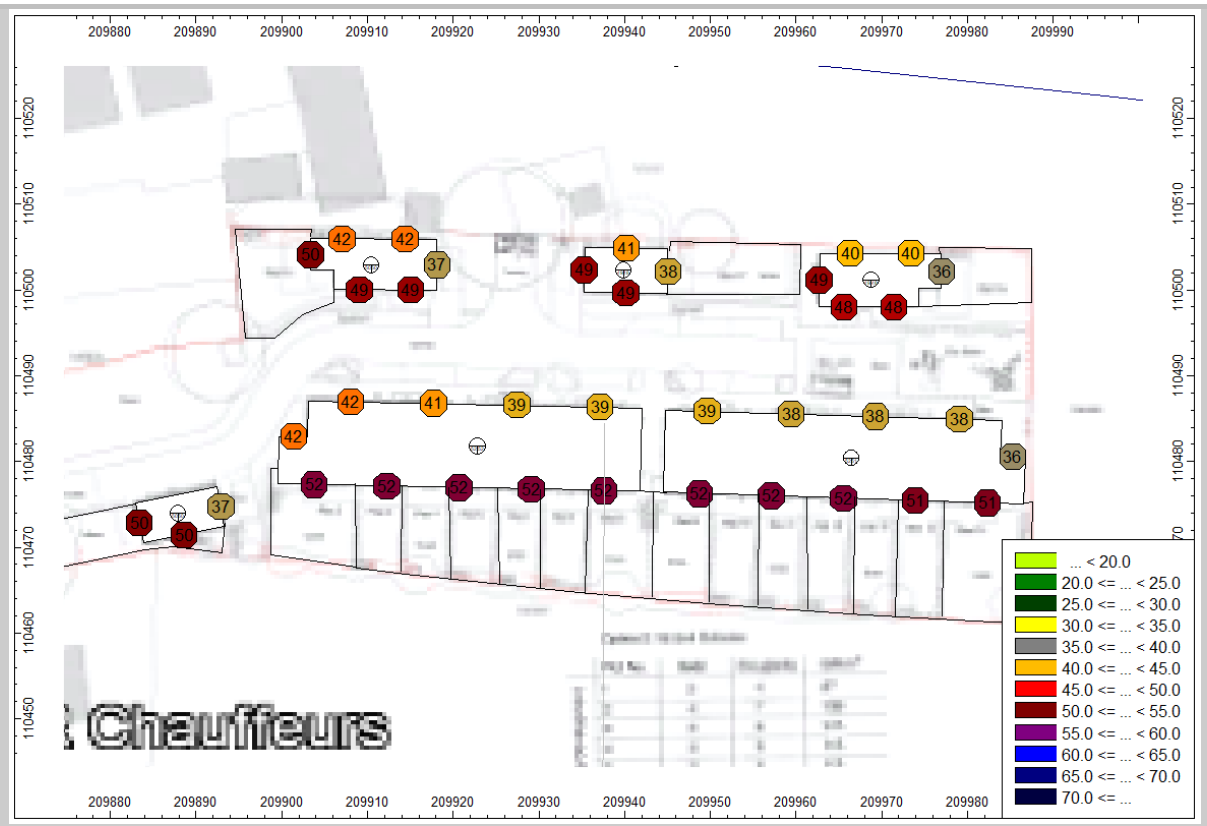
Night time prior to development

9.4 Proposed Noise levels – Daytime (07:00 – 23:00)



Daytime post development

9.5 Proposed Noise levels – Night Time (23:00 – 07:00)



Night Time post development

9.6 Recommendations

For the purpose of this assessment, the corresponding façade levels will be used within the BS 8233: 2014 calculations in order evaluate the worst-case scenario and select the correct window specification.

Therefore, in order to achieve the required noise levels of $L_{Aeq\ 16\ HOUR}$ 35 dB for habitable rooms daytime and $L_{Aeq\ 8\ HOUR}$ 30 dB for Bedroom at night within the proposed, the following additional acoustic measures have been calculated.

It should be noted that the calculations have been made with the proposed windows closed. Additional calculations were made for the top floor due to the influence of sound transmission into the various rooms via the roof / ceiling i.e. an increased impeding façade. Inputted levels into the calculation sheets have been corrected for distance attenuation and free field in accordance with the aforementioned British Standard.

9.7 Calculation Procedure to BS 8233: 2014

The following calculations have been carried out in order to determine the required window and ventilation specification in order to meet the requirements of BS 8233: 2014.

9.8 Ground Floor Living – Façade Corrected to 60 dB

Recorded Site Data (Corrected for Free Field)	Octave Band Centre Frequency (Hz)					
	125	250	500	1000	2000	4000
Daytime Leqff	57.1	55.8	55.7	56.9	51.5	46.9
Night time Leqff	48.9	48.6	47.5	49.1	42.6	39.9

Room Data	Sf	Sr	Swi	Sew	Srr	Volume
Area m^2	10	0	3	7	0	48

Specification Summary	Site Specific Specification	Attenuation Required	
Glazing Specification	4mm / (6-16mm) / 4mm	Rw(C; Ctr)	29(-1,-4) dB
Ventilation Strategy	Titon V25 / Std. Canopy	Dne'w	35 dB
Wall Specification	Brick & Block Cavity Wall	Rw	54 dB
Roof Specification	Standard Pitched Roof with 2 x 15mm soundbloc	Rw	59 dB

Detailed Specification	Octave Band Centre Frequency (Hz)					
	125	250	500	1000	2000	4000
Glazing Specification (Rwi)	21.0	17.0	25.0	35.0	37.0	31.0
Ventilation Strategy (Dne)	35.9	37.6	36.3	31.8	36.8	40.4
Wall Specification (Rew)	40.0	44.0	45.0	51.0	56.0	56.0
Roof Specification (Rrr)	44.0	51.0	57.0	61.0	58.0	63.0

Calculation Results			
Daytime Hours (07:00-23:00)	$L_{Aeq\ 16\ HOUR}$	31.2	dB(A)
Night Time Hours (23:00-07:00)	$L_{Aeq\ 8\ HOUR}$	23.5	dB(A)

Formula	Leq2=Leqff+10log[A0/S*10^(-Dne/10)+Swi/S*10^(-Rwi/10)+Sew/10*10^(-Rew/10)+Srr/S*10^(-Rrr/10)] +10log(S/A) +3
Note	The expected precision of this calculation is ±2 dB.

9.9 Top Floor Bedroom – Façade Corrected to 52 dB

Recorded Site Data (Corrected for Free Field)	Octave Band Centre Frequency (Hz)					
	125	250	500	1000	2000	4000
Daytime Leqff	57.1	55.8	55.7	56.9	51.5	46.9
Night time Leqff	48.9	48.6	47.5	49.1	42.6	39.9

Room Data	Sf	Sr	Swi	Sew	Srr	Volume
Area m^2	10	16	2	8	16	38

Specification Summary	Site Specific Specification	Attenuation Required	
Glazing Specification	4mm / (6-16mm) / 4mm	Rw(C; Ctr)	29(-1,-4) dB
Ventilation Strategy	Titon V25 / Std. Canopy	Dne'w	35 dB
Wall Specification	Brick & Block Cavity Wall	Rw	54 dB
Roof Specification	Standard Pitched Roof with 2 x 15mm soundbloc	Rw	59 dB

Detailed Specification	Octave Band Centre Frequency (Hz)					
	125	250	500	1000	2000	4000
Glazing Specification (Rwi)	21.0	17.0	25.0	35.0	37.0	31.0
Ventilation Strategy (Dne)	35.9	37.6	36.3	31.8	36.8	40.4
Wall Specification (Rew)	40.0	44.0	45.0	51.0	56.0	56.0
Roof Specification (Rrr)	44.0	51.0	57.0	61.0	58.0	63.0

Calculation Results			
Daytime Hours (07:00-23:00)	$L_{Aeq\ 16\ HOUR}$	30.3	dB(A)
Night Time Hours (23:00-07:00)	$L_{Aeq\ 8\ HOUR}$	22.5	dB(A)

Formula	Leq2=Leqff+10log[A0/S*10^(-Dne/10)+Swi/S*10^(-Rwi/10)+Sew/10*10^(-Rew/10)+Srr/S*10^(-Rrr/10)] +10log(S/A) +3
Note	The expected precision of this calculation is ±2 dB.

9.10 Glazing (R_{wi})

Octave Band Frequency	125	250	500	1000	2000	4000	$R_{w\ (C;Ctr)}$
4mm glass / 16mm air gap / 6mm glass	21.0	17.0	25.0	35.0	37.0	31.0	29 (-1,-4)

9.11 Ventilation (R_{wi})

Octave Band Frequency	125	250	500	1000	2000	4000	Dne'w
Titon V25 / Standard Canopy	35.9	37.6	36.3	31.8	36.8	40.4	35 dB

9.12 Walls (Non-Glazed Elements) (R_{ew})

Octave Band Frequency	125	250	500	1000	2000	4000	R_w
Minimum External Wall Attenuation	40.0	44.0	45.0	51.0	56.0	56.0	54

9.13 Roof (R_{rr})

Octave Band Frequency	125	250	500	1000	2000	4000	R_w
Minimum Value	44.0	51.0	57.0	61.0	58.0	63.0	59 dB

NOTE:

The above are minimum construction attenuation values and should alternative methods be selected; these should be equal to or greater than the above corresponding values. Calculations carried out have indicated the following specifications should be installed for this site.

9.14 Glazing & Ventilation Assessment

The development should be designed with a 4mm glass / 16mm air gap / 4mm glass double glazed windows and a Titon V25 / Standard Canopy or similarly approved to all rooms to ensure the internal noise levels are acceptable in terms of the assessment to British Standard 8233: 2014. To further protect the future residents, it is recommended to upgrade the standard top floor ceiling to 2 x 15mm soundbloc board.

10 APPROVED DOCUMENT O 2021 – 'OVERHEATING'

10.1 Approved Document O – Section 3: Ensuring the Overheating Mitigation Strategy is Usable.

Building Regulations 2010 Approved Document O 2021 'Overheating' states the following within Section 3: 'Ensuring the Overheating Mitigation Strategy is Usable':-

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

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

a. 40dB L , averaged over 8 hours (between 11pm and 7am)
b. 55dB L , more than 10 times a night (between 11pm and 7am).

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

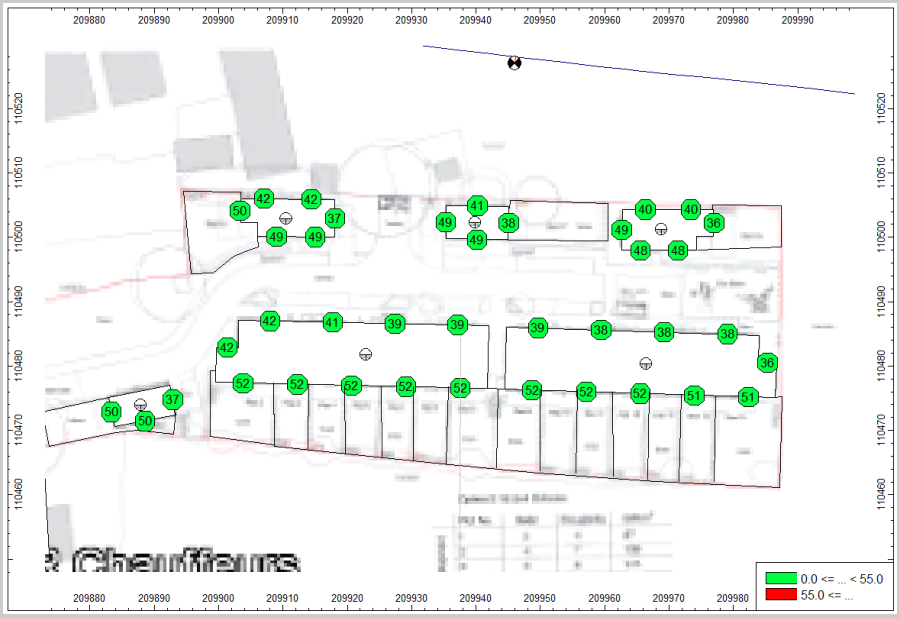
NOTE: Guidance on reducing the passage of external noise into buildings can be found in the National Model Design Code: Part 2 – Guidance Notes (MHCLG, 2021) and the Association of Noise Consultants' Acoustics, Ventilation and Overheating: Residential Design Guide (2020)

10.2 Assessment of Openable Windows

The following Table demonstrates which plots of the proposed development would be able to utilise openable windows to mitigate overheating and still achieve the above values:-

10.2.1 $L_{Aeq\ 8\ Hour}$ dB

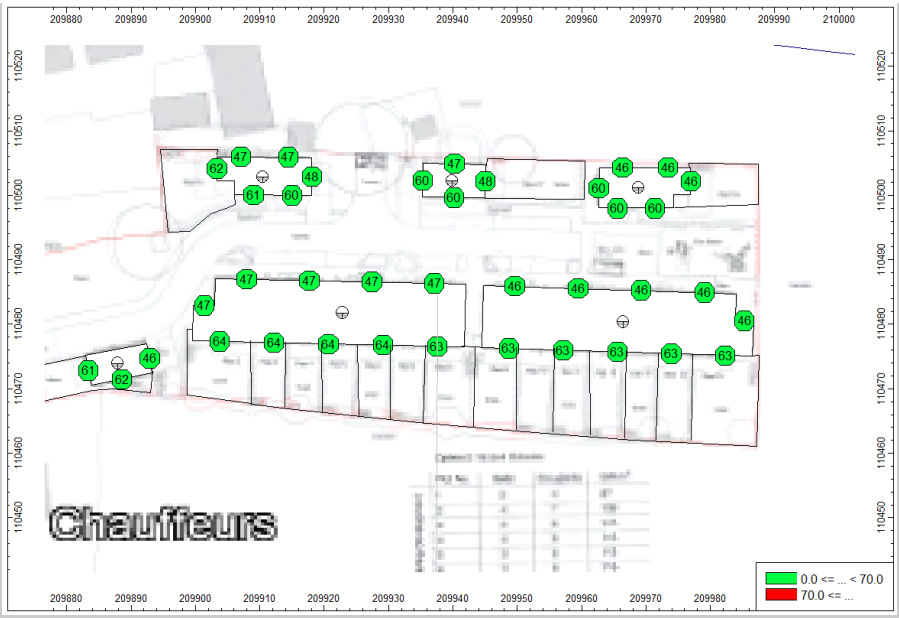
Calculated Façade Levels	Open Window Façade Attenuation	Calculated Internal Noise Level
$L_{Aeq\ 8\ Hour}$ 55 dB	-15 dB(A)	$L_{Aeq\ 8\ Hour}$ 40 dB



CALCULATED FAÇADE LEVELS SUITABLE FOR OPENABLE WINDOWS FOR OVERHEATING PURPOSES ONLY

10.2.2 $L_{Amax\ '>10\ times/night'}$ dB

Calculated Façade Levels	Open Window Façade Attenuation	Calculated Internal Noise Level
$L_{Amax\ '>10\ times/night'}$ 70 dB	-15 dB(A)	$L_{Amax\ '>10\ times/night'}$ 55 dB



CALCULATED FAÇADE LEVELS SUITABLE FOR OPENABLE WINDOWS FOR OVERHEATING PURPOSES ONLY

10.3 TM59 Overheating 'Assessment of Requirement for Testing'

With regards to potential overheating at the proposed development and any TM59 assessment that may be required for this site, we would like to confirm that having opening windows to dissipate excessive summer heat vs the internal acoustics is always a fine balancing act.

With regards to the internal acoustic criteria of Daytime $L_{Aeq\ 16\ HOUR}$ 35 dB and Night Time $L_{Aeq\ 8\ HOUR}$ 30 dB, this is a planning requirement under BS 8233: 2014 to which this report and calculations have been carried out to and is based on. This assessment has detailed the glazing and ventilation requirements required in order to achieve these criteria based on the assumption that the windows are closed.

References and assessments are to be made to the Association of Noise Consultants 'Acoustic Ventilation & Overheating – Residential Design Guide' 2020. The calculations carried out within this report have identified an acoustic requirement for System 1 & 2 and therefore guidelines values from Table 4 of BS 8233: 2014 are to be adopted.

This document takes a Level 1 and Level 2 approach to an acoustic overheating assessment and depending on the outcome of Level 1, further determines the need or necessity for a Level 2 assessment.

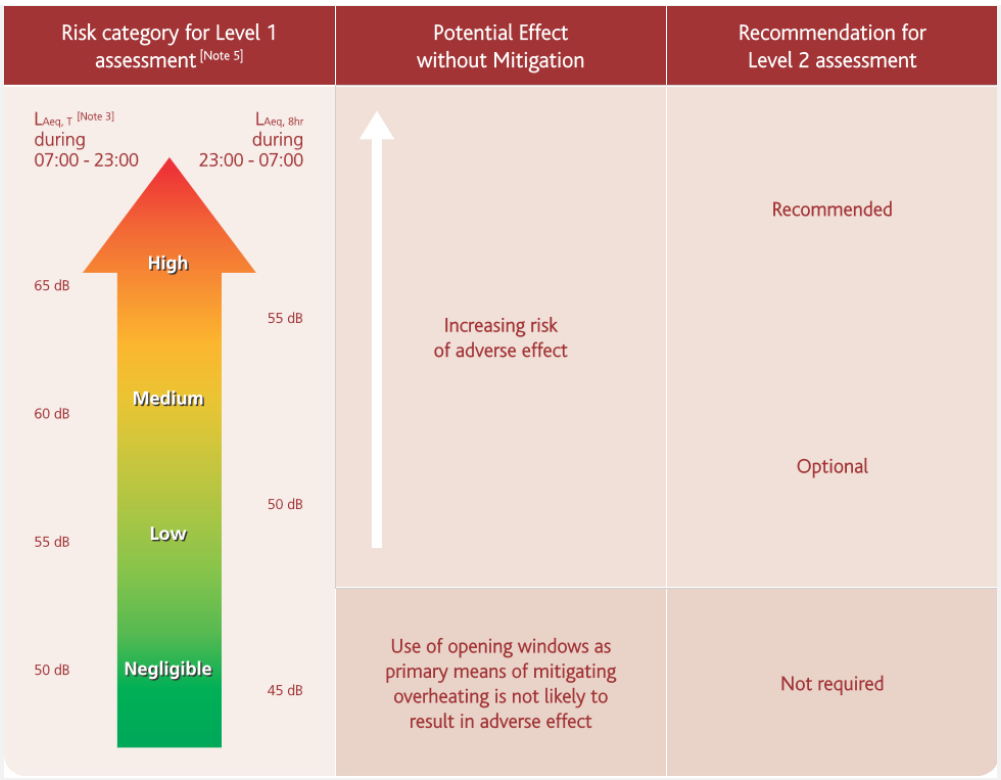
10.3.1 Table 3.1 - Indoor Ambient Noise Levels Resulting from Transport Noise Sources

Table 3.1 'Indoor ambient noise levels resulting from transport noise sources – ADF ventilation condition'

Ventilation condition	Operational condition of System	Desirable internal ambient noise level from transport noise sources
Part F - Whole dwelling ventilation	Systems 1 & 2: Background ('trickle') ventilators open to provide whole dwelling ventilation in the winter period. Additional ventilation required at other times of the year – windows are assumed to be ajar for assessment [Note 2].	Guideline values from Table 4 of BS 8233:2014.
	System 3: Continuous mechanical extract with background ('trickle') ventilators open [Note 2].	
	System 4: Continuous mechanical supply and extract with heat recovery (MVHR) – no trickle vents required.	
Part F – Purge Ventilation [Note 1]	Option 1: Opening external window(s) meeting requirements described in Appendix B of Part F.	No specific acoustic criterion needs to be met in a room using purge ventilation for the purpose of rapidly diluting indoor pollutants.
	Option 2: Manually controlled fan extracting 4 air changes per hour.	

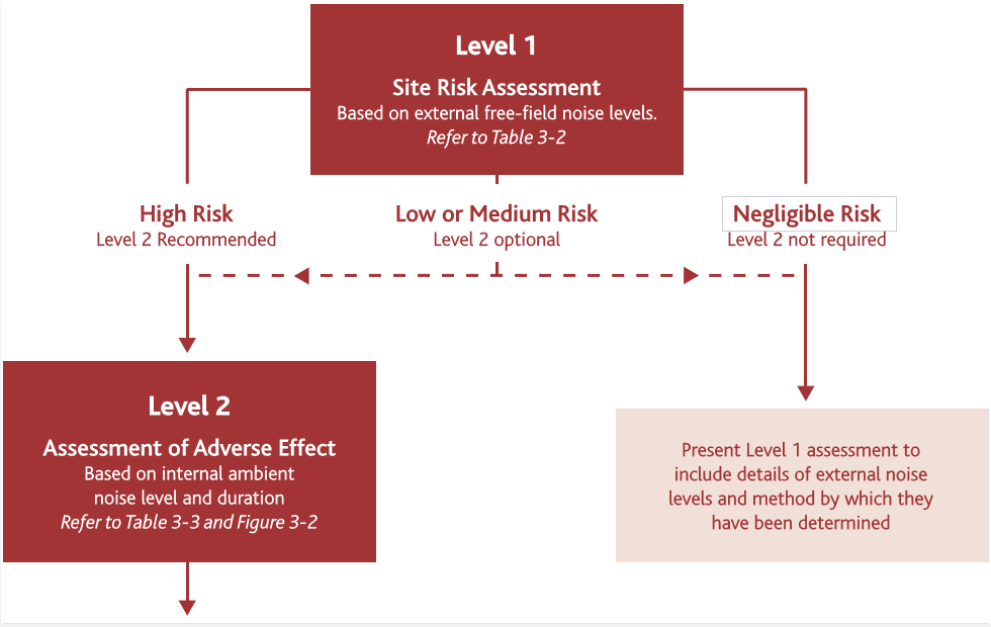
10.3.2 figure 3.2 - Guidance for Level 1 Site Risk Assessment of Noise from Transport Noise Sources Relating to Overheating Condition

Figure 3.2 Guidance for Level 1 site risk assessment of noise from transport noise sources relating to overheating condition



10.3.3 Figure 3.1 Two-Level Noise Assessment Procedure

Figure 3.1 Two-level noise assessment procedure - overheating condition



10.3.4 Requirement for Testing Conclusion

Based on the above assessments, it is the concluded that a detailed TM59 assessment is optional for this site.

11 LAmax dB NOISE LEVEL ASSESSMENT

11.1 Criteria

11.1.1 Night Noise Guidelines Europe 2009

The Night Noise Guidelines 2009 make direct reference to the World Health Organisations Guidelines for Community Noise 1999 with recommended guideline criteria of L_{Aeq} 30 dB indoors for continuous noise. The document goes on to explain that sleep disturbance correlates best with L_{Amax} and effects have been observed at 45 dB or less. This is particularly true if the background noise level is low. Noise events exceeding 45 dB(A) should therefore be limited.

11.1.2 Professional Practice Guidance on Planning & Noise.

PRoPG: Planning and Noise Appendix A 'Dealing with Noise Events' A.17 states that:-

Various studies have linked the L_{Amax} from individual noise events to behavioural awakenings. For example one study found that the "Probability of sleep stage changes to wake/S1 from railway noise increased significantly from 6.5% at 35 dB(A) to 20.5% at 80 dB(A) $L_{Amax,F}$ whilst another study concluded that "noise disturbance of sleep may be expected to become significant once the outdoor L_{Aeq} exceeds 55 dB provided peak noise levels do not exceed 75 to 80 dB. Higher L_{Aeq} values up to 60 dB may be allowed providing the peak levels do not exceed 85 dB, and the number of such events is less than about 20 per night". Based on these studies it can be concluded that at night (2300 - 0700 hrs) a significant effect on sleep disturbance e.g. behavioural awakening, is likely to occur where the maximum sound level at the façade of a building with partially open windows is above:

85 dB $L_{Amax,F}$ (where the number of events exceeding this value is ≤ 20); or
80 dB $L_{Amax,F}$ (where the number of events exceeding this value is > 20).

Pro PG: Planning and Noise Appendix A 'Dealing with Noise Events' A.18 goes on to explain that the main body of sleep research is consistent with a careful interpretation of the viewpoint set out in the World Health Organisation Guidelines which for the ordinary population is that:

- ✓ *Impacts on sleep can be detected from relatively low level maximum noise events, however the degree of resulting harm may not be significant.*
- ✓ *'Effects' on sleep (such as EEG awakenings and sleep stage changes) occur spontaneously in the general population many times per night regardless of any impacts due to noise.*
- ✓ *The smaller the number of noise events, the louder the maximum noise level that can be tolerated without adverse effects upon sleep; subject to an upper limit.*
- ✓ *At relatively low levels e.g. around 45 dB $L_{Amax,F}$ when sufficient number of such events take place during the night the adverse effects of individual noise events are likely to be limited to sleep disturbance in the form of changes in sleep state or perhaps some EEG awakenings.*
- ✓ *It normally requires noise levels higher than 45 dB $L_{Amax,F}$ before significant adverse effects such as behavioural awakenings, difficulty getting to sleep, premature awakening or difficulty getting back to sleep generally occur and the latest field research on and aircraft noise suggest that it requires internal L_{Amax} noise levels of around 65 dB before noise induced awakenings become distinguishable from spontaneous awakenings).*

11.1.3 World Health Organisations 'Guidelines for Community Noise'.

The WHO Guideline for Community Noise suggests that levels of L_{AFmax} 45 dB should not exceed more than 10 events within any one night time period 23:00 – 07:00. Therefore, calculations and assessments are to be made against these criteria to ascertain if the proposed glazing and ventilation specification will be suitable to achieve that of the assessed 11th highest recorded L_{AFmax} dB level.

L_{AFmax} dB Noise Levels >80 dB					
L_{AFmax} dB	79.7	80.0	80.1	79.1	74.9
Time	Fig 1	Fig 2	Fig 3	Fig 4	Fig 5
	0	0	1	0	0

L_{AFmax} dB Noise Levels >85 dB					
L_{AFmax} dB	79.7	80.0	80.1	79.1	74.9
Time	Fig 1	Fig 2	Fig 3	Fig 4	Fig 5
	0	0	0	0	0

11.1.4 LAFmax dB Noise Levels – Night Time 23:00 – 07:00 (1 Minute Data)

1 Minute Event No.	Recorded L_{AFmax} dB Noise Levels	Façade Corrected L_{AFmax} dB Noise Levels
1	80.1	80.1
2	74.1	74.1
3	72.3	72.3
4	71.5	71.5
5	71.4	71.4
6	70.0	70.0
7	69.5	69.5
8	69.5	69.5
9	69.4	69.4
10	69.4	69.4
11	68.5	68.5

The following table demonstrate the results and the evaluated 11th highest L_{Amax} dB level. With the proposed glazing and ventilation strategies implemented on this site, the following calculated internal levels have been evaluated accordingly:-

Item		Night Time (23:00-07:00)	Description
1	Recorded External Noise Level	50.8	Recorded Noise Level at the Monitoring Position
2	Calculated Highest Façade Level	52.0	Highest recorded façade level of the proposed development closest to the above associated monitoring position.
3	Façade Correction	+1.2	Difference between Recorded and Calculated (Item 1 and 2)
4	Calculated Façade Attenuation	29.5	Calculated façade attenuation taken from the highest recorded LAeq 8 HOUR dB night time noise level, minus the highest calculated internal noise level taken from the BS 8233 calculations.
5	LAmax 45 dB Criteria	45	LAmax 45 dB Criteria taken from WHO Guidelines. BS 8233 does not reference LAmax dB noise level criteria.
6	Calculated Façade Level Outside	74.5	Addition of Items 4 and 5 to give a resultant target level for the 11th Recorded LAmax
7	11th Recorded LAmax	64.3	11th Recorded LAmax
8	LAmax Criteria Achieved	YES	If Item 7 is less than 6, then the site is likely to be compliant. If not, further calculations are required

The above table demonstrates that the upgraded glazing and ventilation will result in the internal LAmax 45 dB criteria being achieved.

12 ELEMENT 3 – EXTERNAL AMENITY AREA NOISE ASSESSMENT

12.1 Outdoor Living Areas

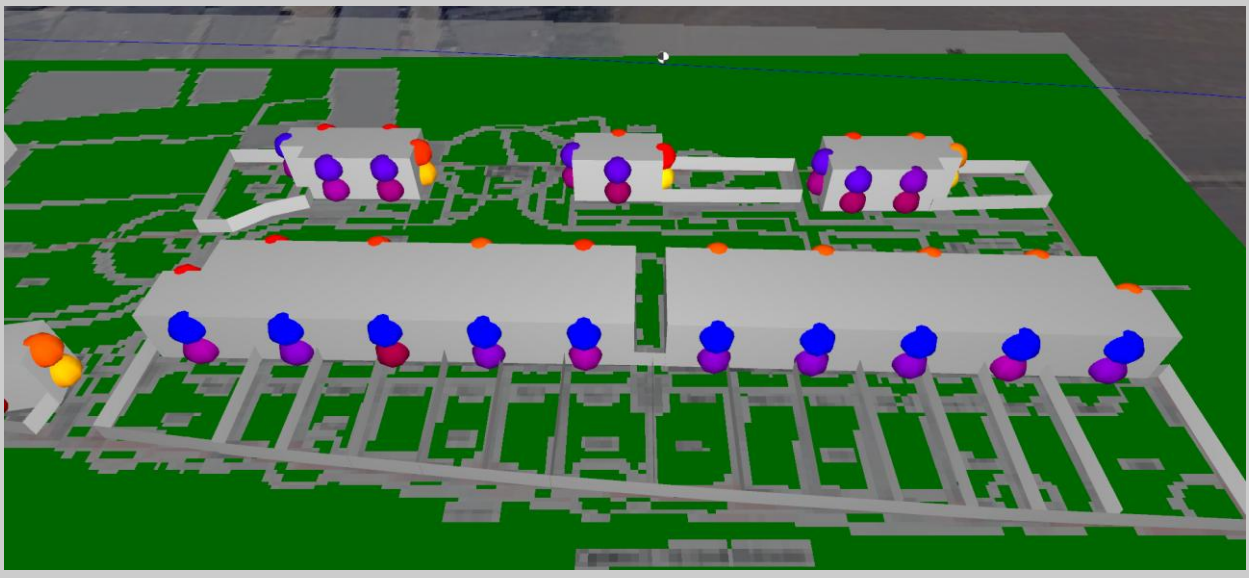
The World Health Organisation 'Guidelines for Community Noise gives guidance as to desirable noise levels that should be achieved within outdoor living areas such as gardens, patios and verandas etc.

Table 1: Guideline values for community noise in specific environments, details the desirable target noise levels within various areas.

Outdoor Living Area	
Serious Annoyance, daytime and evening	$L_{Aeq\ 16\ HOUR}$ 55 dB
Moderate Annoyance, daytime and evening	$L_{Aeq\ 16\ HOUR}$ 50 dB

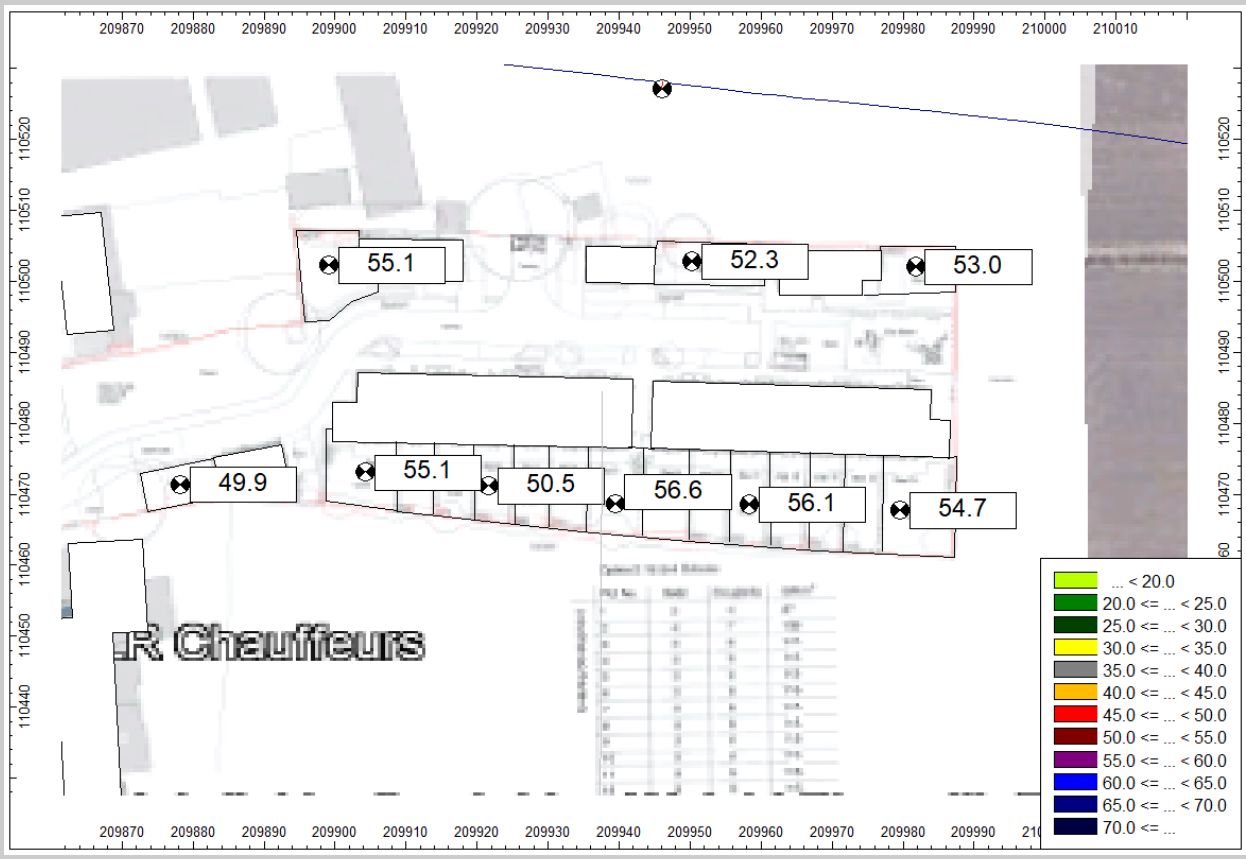
In order to evaluate the external noise levels within the proposed development, and to correctly and accurately select the precise required minimum screen heights, the 3D modelling software CADNA A is to be used. Initially, the site plan is to be overlaid onto Google Earth and then imported directly into CADNA A using the geometric co-ordinates.

From this, the monitoring positions and noise sources such as roads are added. The output noise levels from the roads are then increased until the monitored noise levels are achieved at the monitoring position. This model is then saved and used as a working 3D acoustic model of the site. The proposed buildings are then constructed on a 3D bases and receptors placed within the terrace garden areas. The calculation software is then run to evaluate the garden levels within sample plots across the development. The following CADNA A screen shots demonstrate the existing sites working 3D model. The levels at the measurement position correlate with the measured daytime average levels detailed within this report.



3D View

The development has external living areas on the development and therefore this criteria / guideline would be appropriately considered within the proposed rear residential garden areas.



Proposed Outdoor Living Areas

The guideline has been considered acceptable criteria for this assessment given the sites geographical location and proximity to a major trunk road and airport. The layout has been in order to allow for acoustics and minimise the noise levels within these outdoor living spaces. The calculation demonstrates the external living spaces are likely to see noise levels just above the upper guideline of 55 dB.

However, BS8233: 2014 states the following:

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

PRoPG: Planning and Noise goes on to state the following with regards to external amenity space:-

Paragraph 2.47

PPG- Noise states: "If amenity spaces are an intrinsic part of the overall design, the acoustic environment of these spaces should be considered so that they can be enjoyed as intended".

Paragraph 2.48

It is noted that both documents require a decision to be made regarding whether or not an external amenity area (or amenity space) is intrinsic to the required design for acoustic, or for other reasons. However, the advice in BS 8233: 2014 states that the resulting noise levels outside are never a reason for refusal as long as levels are designed to be as low as practicable. Whereas, to comply with policy guidance any amenity space must have an acoustic environment so that it can be enjoyed as intended.

Element 3 – External Amenity Space

Paragraph 3 (iii)

These guideline values may not be achievable in all circumstance where development might be desirable. In such situations, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces.

The Noise Policy Statement for England (NPSE) also states that:-

Paragraph 2.3

Furthermore, the broad aim of noise management has been to separate noise sources from sensitive noise receptors and to minimise noise. Of course, taken in isolation and to a literal extreme, noise minimisation would mean no noise at all. In reality, although it has not always been stated, the aim has tended to be to minimise noise 'as far as reasonably practical'. The concept can be found in the Environmental Protection Act 1990, where, in some circumstances, there is a defence of 'best practicable means' in summary statutory nuisance proceedings.

Paragraph 2.7

In addition, 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 practical policy, development or other activity may not have been given adequate weight when assessing the noise implications.

Paragraph 2.22

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 a specific SOAEL value in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available.

In summary, the external living spaces have been reduced by the location of the proposed bund with screen on top to as low as is reasonably practicable and therefore in accordance with the guidance set out above, planning permission should not be refused and external noise should not be considered in isolation.

13 ELEMENT 4 – ASSESSMENT OF OTHER RELEVANT ISSUES

13.1 The National Planning Policy Framework 2023(NPPF)

The National Planning Policy Framework 2023(NPPF) and assessments to the Noise Policy Statement for England 2010 (NPSE) should be made in conjunction with each other. Paragraphs 191 - 194 of the National Planning Policy Framework 2023(NPPF) states the following:

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

a) Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life.
b) Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

Paragraph 192 Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications.

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

Paragraph 194 The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities

The Noise Policy Statement for England gives various levels of effect as detailed within this report.

With the glazing / ventilation specifications achieved within this report, the development can be implemented within the guidelines of the aforementioned documents and ensure a conclusion of **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.

14 ACOUSTIC DESIGN STATEMENT

Good Acoustic Design	Given the size and orientation of the proposed site, it is recommended that the developer adopted, where practically possible, a good acoustic design which should include careful consideration of the positioning of the proposed properties together with thoughts being taken as to internal layouts to minimise noise sensitive rooms facing onto dominant noise sources within the local areas. Given the size of this development, every effort has already been made to minimise the acoustic impact from the surrounding areas.
Internal Noise Levels	Calculations have been carried out and assessments made to BS 8233: 2014 together with design specifications supplied for the required glazing and ventilation specifications required across the development to ensure compliance.
LAmax dB Noise Levels	Assessments and calculations demonstrate that the LAmax dB Levels are below the recommended criteria set out within PRoPG
External Living Areas	The guideline has been considered acceptable criteria for this assessment given the sites geographical location and proximity to a major trunk road and airport. The layout has been in order to allow for acoustics and minimise the noise levels within these outdoor living spaces. The calculation demonstrates the external living spaces are likely to see noise levels just above the upper guideline of 55 dB.
NPPF & NPSE	With the glazing / ventilation specifications achieved within this report, the development can be implemented within the guidelines of the aforementioned documents and ensure a conclusion of 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.
OVERALL OUTCOME	**NOEL – No Observed Effect Level**

15 RECOMMENDATION TO DECISION MAKER

Levels have been recorded and assessments made in accordance with the relevant standards. Internal criteria's have been set and calculations made in order to determine the minimum construction details required in order to meet the desired level within the proposed residential dwellings and satisfy the local council's requirements.

National Planning Policy Framework 2023 suggests that planning permission should be granted unless any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in the framework taken as a whole, or specific policies in the framework indicate the application should be restricted.

Based on the calculations and assessments made within this report it is the professional opinion of Sound Advice Acoustics Ltd that the proposed development can demonstrate compliance with the National Planning Policy Framework 2023, NPPF & NPSE and that, with regards to sound, planning permission can be granted using the following parameters.

As indicated in Section 2 of PRoPG, following the PRoPG approach will lead to the choice of one of four possible recommendations from the noise practitioner to the decision maker:

A. Planning consent may be granted without any need for noise conditions;
B. Planning consent may be granted subject to the inclusion of suitable noise conditions;
C. Planning consent should be refused on noise grounds in order to avoid significant adverse effects ("avoid"); or
D. Planning consent should be refused on noise grounds in order to prevent unacceptable adverse effects ("prevent").

RECOMMENDATION TO DECISION MAKER

Grant with Noise Conditions

16 CONCLUSION

16.1 Background Noise Levels

A 96 hour background noise survey was undertaken from 23rd – 27th February 2023 at two positions on the site in order to establish the underlying background noise levels. The recorded levels are as follow: -

Assessment Position	Date Start	Date Finish	Daytime LAeq	Night time LAeq
Position 1	23/02/2023	27/02/2023	59.8	55.7
Position 2	23/02/2023	27/02/2023	59.0	50.8

16.2 Potential Façade Noise Levels

16.2.1 Daytime (07:00-23:00)

Time Period	Highest Potential Façade Noise Level	Noise Risk Category 1 - Low
Average Daytime (07:00-23:00)	$L_{Aeq,\ 16\ HOUR}$ 60 dB	50 - 63 dB

16.2.2 Night Time (23:00-07:00)

Time Period	Highest Potential Façade Noise Level	Noise Risk Category 1 - Low
Average Night Time (23:00-07:00)	$L_{Aeq,\ 16\ HOUR}$ 52 dB	40 – 55 dB
	Maximum (10 Times) – L_{Amax} 64.3 dB	>80 dB (10 Times in 8 Hours)

16.3 Risk Assessment

16.3.1 Daytime (07:00-23:00) – Position 1

Risk Assessment Category	Risk Assessment
1 – Low	At low noise levels, the site is likely to be acceptable from a noise perspective provided that 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 in the finished development.

16.3.2 Night Time (23:00-07:00) – Position 1

Risk Assessment Category	Risk Assessment
1 – Low	At low noise levels, the site is likely to be acceptable from a noise perspective provided that 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 in the finished development.

The above table demonstrates this site is located within Noise Risk Category 1 which suggests a low level of risk for daytime levels and Noise Risk Category 1 which suggests a low level of risk for night time levels.

16.4 Glazing & Ventilation Specification

The development should be designed with a 4mm glass / 16mm air gap / 4mm glass double glazed windows and a Titon V25 / Standard Canopy or similarly approved to all rooms to ensure the internal noise levels are acceptable in terms of the assessment to British Standard 8233: 2014. To further protect the future residents, it is recommended to upgrade the standard top floor ceiling to 2 x 15mm soundbloc board.

16.5 WHO Guidelines for Community Noise

The development proposes external living areas and therefore an assessment to the World Health Organisation's 'Guidelines for Community Noise' has been carried out. The guideline has been considered acceptable criteria for this assessment given the sites geographical location and proximity to a major road network and airport. The calculation demonstrates the external living spaces are likely to see noise levels just above the upper guideline of 55 dB.

However, BS8233: 2014 states the following:
'For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB LAeq,T, with an upper guideline value of 55 dB LAeq,T which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited'

16.6 Conclusion

Levels have been recorded and assessments made in accordance with the relevant standards. Internal criteria's have been set and calculations made in order to determine the minimum construction details required in order to meet the desired level within the proposed residential dwellings and satisfy the local council's requirements.

National Planning Policy Framework 2023 suggests that planning permission should be granted unless any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in the framework taken as a whole, or specific policies in the framework indicate the application should be restricted.

Based on the calculations and assessments made within this report it is the professional opinion of Sound Advice Acoustics Ltd that the proposed development can demonstrate compliance with the National Planning Policy Framework 2023, NPPF & NPSE and that, with regards to sound, planning permission can be granted.

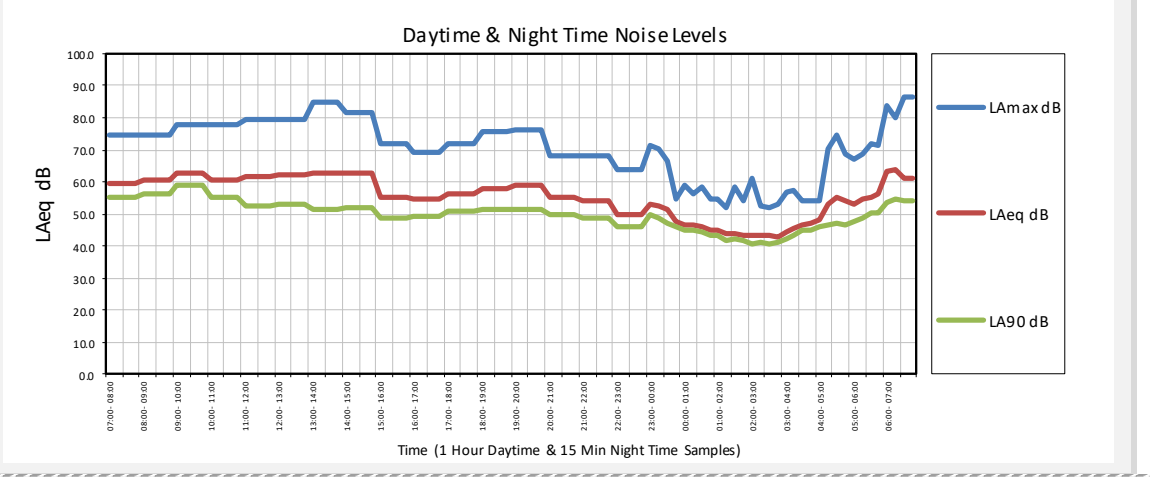
17 APPENDIX A - RESULTS

17.1 23rd – 24th February 2023 Position 1

NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LAeq 16 HOUR & Corresponding LAmax 16 HOUR	59.8	85.0	52.0	64.7	56.4	59.1	59.8	54.5	47.5	40.4	37.9	18.1
NIGHT TIME 23:00 - 07:00 LAeq 8 HOUR & Corresponding LAmax 8 HOUR	55.2	86.6	47.0	57.3	49.8	53.1	54.2	50.1	44.4	43.9	38.7	20.1

DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
07:00 - 08:00	59.3	74.5	55.0	65.4	56.5	60.3	59.6	53.5	42.3	42.5	40.8	21.1
08:00 - 09:00	60.6	74.3	56.0	68.6	59.5	61.3	60.8	55.0	45.7	39.9	38.4	17.9
09:00 - 10:00	62.9	77.7	59.0	68.1	59.0	62.4	63.0	57.2	50.2	45.3	43.5	22.6
10:00 - 11:00	60.8	77.7	55.0	67.5	58.9	61.4	60.7	55.2	48.2	43.4	41.9	20.3
11:00 - 12:00	61.9	79.5	52.0	65.5	57.8	59.9	62.0	56.6	50.1	42.8	38.0	19.6
12:00 - 13:00	62.3	79.4	53.0	66.1	58.6	60.7	62.4	57.2	50.9	37.0	39.0	18.8
13:00 - 14:00	62.5	85.0	51.0	65.9	57.8	60.7	62.7	57.2	51.2	36.8	33.8	16.7
14:00 - 15:00	62.7	81.7	52.0	65.5	58.1	60.4	62.5	57.6	51.9	43.7	31.6	17.1
15:00 - 16:00	55.2	72.1	49.0	59.6	52.3	54.2	55.1	50.0	41.9	40.8	37.3	17.0
16:00 - 17:00	54.5	69.4	50.0	59.8	51.1	53.7	54.4	49.2	41.7	38.8	36.1	16.7
17:00 - 18:00	56.5	71.7	51.0	61.4	52.9	56.3	56.1	51.0	43.0	42.9	41.2	20.6
18:00 - 19:00	57.9	75.7	51.0	62.6	54.5	58.2	57.9	52.9	44.1	27.3	19.8	11.9
19:00 - 20:00	59.1	76.2	52.0	62.3	55.6	59.2	58.6	54.7	46.0	29.5	18.2	11.4
20:00 - 21:00	55.0	68.3	50.0	59.8	52.6	55.2	54.8	50.2	42.4	26.3	16.7	11.0
21:00 - 22:00	54.1	68.3	49.0	60.7	52.4	54.1	53.6	49.3	41.7	25.8	16.7	11.1
22:00 - 23:00	49.9	64.0	46.0	57.5	48.3	49.4	49.3	45.4	38.0	21.5	13.6	10.7

NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
23:00 - 23:15	53.2	71.6	50.0	59.1	50.9	52.2	52.0	49.2	42.8	28.0	19.3	14.9
23:15 - 23:30	52.5	70.1	49.0	58.2	50.7	51.3	52.0	47.8	41.1	24.5	17.5	14.7
23:30 - 23:45	51.4	66.6	47.0	58.9	49.3	50.2	50.2	47.7	39.8	23.2	16.0	14.6
23:45 - 00:00	47.7	54.9	46.0	54.2	45.4	46.4	44.9	44.5	37.0	32.9	26.7	15.0
00:00 - 00:15	46.8	59.2	45.0	54.2	47.0	46.3	44.1	43.6	35.8	26.4	20.8	14.6
00:15 - 00:30	46.7	56.3	45.0	52.9	44.4	44.7	43.7	44.0	36.5	21.6	15.8	14.6
00:30 - 00:45	45.8	58.3	44.0	52.2	44.0	44.6	43.1	42.9	34.8	20.9	15.8	14.6
00:45 - 01:00	44.7	54.9	43.0	51.7	43.0	43.6	42.4	41.7	33.1	20.3	15.5	14.6
01:00 - 01:15	45.2	54.4	43.0	51.9	43.1	43.5	42.2	42.4	35.1	21.0	15.7	14.6
01:15 - 01:30	44.0	51.7	42.0	49.9	43.2	42.5	40.7	41.2	34.1	20.9	17.1	14.8
01:30 - 01:45	43.9	58.4	42.0	49.9	41.8	42.3	40.6	41.0	34.6	23.3	16.1	14.6
01:45 - 02:00	43.4	54.0	42.0	52.0	43.3	41.6	40.5	40.4	33.3	21.9	16.0	14.6
02:00 - 02:15	43.5	61.3	41.0	49.8	41.6	42.1	41.4	40.1	32.9	21.6	16.1	14.6
02:15 - 02:30	43.3	52.7	41.0	50.4	40.9	40.6	39.8	40.8	33.5	22.3	16.1	14.6
02:30 - 02:45	43.3	51.9	41.0	49.6	40.9	40.7	39.9	40.6	33.8	23.3	17.1	14.6
02:45 - 03:00	42.9	53.1	41.0	50.6	41.3	40.7	39.6	40.2	33.1	22.5	15.9	14.6
03:00 - 03:15	44.6	56.9	42.0	51.3	41.6	41.5	41.2	41.9	35.3	23.4	16.0	14.6
03:15 - 03:30	45.6	57.3	43.0	51.3	42.6	42.4	42.0	43.0	36.4	23.0	15.9	14.6
03:30 - 03:45	46.6	54.3	45.0	51.1	42.7	43.2	42.6	44.1	37.5	23.2	15.9	14.6
03:45 - 04:00	47.2	53.9	45.0	51.6	43.0	43.8	43.9	44.4	38.0	26.5	16.7	14.6
04:00 - 04:15	48.2	54.3	46.0	52.3	43.5	44.7	44.7	45.5	39.4	27.1	17.8	14.7
04:15 - 04:30	52.8	70.5	47.0	59.4	47.9	50.3	51.7	48.7	43.3	32.6	23.4	14.9
04:30 - 04:45	55.4	74.5	47.0	55.2	49.0	54.2	53.2	50.1	43.0	47.2	43.3	20.7
04:45 - 05:00	54.3	68.8	47.0	55.2	48.4	49.3	51.9	48.8	43.4	47.0	42.4	20.3
05:00 - 05:15	53.1	67.1	48.0	54.7	46.7	49.0	50.2	47.9	42.2	45.9	41.7	19.4
05:15 - 05:30	54.8	68.6	49.0	55.7	47.9	50.2	52.5	49.3	43.6	46.9	44.4	21.8
05:30 - 05:45	55.3	71.8	50.0	56.6	49.6	53.1	54.0	50.5	45.0	43.8	36.9	17.1
05:45 - 06:00	56.5	71.3	50.0	57.1	50.9	54.0	55.6	52.1	45.4	42.8	37.3	17.6
06:00 - 06:15	63.4	83.5	53.0	62.6	56.7	62.6	63.0	58.5	51.7	46.9	43.0	21.1
06:15 - 06:30	64.0	80.2	55.0	65.4	58.8	61.8	63.7	58.8	54.0	46.6	43.5	21.7
06:30 - 06:45	61.2	86.6	54.0	62.6	54.8	58.0	59.8	55.0	50.3	53.5	47.0	29.5
06:45 - 07:00	61.2	86.6	54.0	62.6	54.8	58.0	59.8	55.0	50.3	53.5	47.0	29.5



17.2 24th – 25th February 2023 Position 1

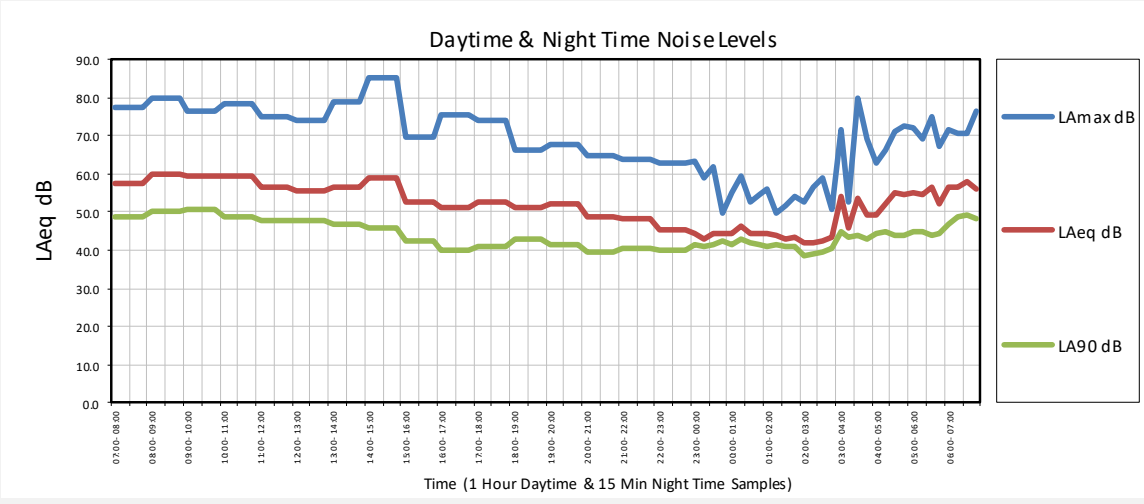
NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)							
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LAeq 16 HOUR & Corresponding LAmax 16 HOUR	55.8	85.1	40.0	60.6	51.8	51.8	54.7	50.4	45.4	44.9	42.7	22.8
NIGHT TIME 23:00 - 07:00 LAeq 8 HOUR & Corresponding LAmax 8 HOUR	51.9	79.6	41.0	54.3	46.0	47.1	51.0	45.9	38.8	43.8	39.7	19.2

DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES

Date / Time	LAeq	LAmax	LA90	Octave Band Centre Frequency (Hz)								
				63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
07:00 - 08:00	57.2	77.1	49.0	60.7	53.0	55.3	56.9	51.9	46.7	41.3	40.8	22.0
08:00 - 09:00	59.6	79.5	50.0	62.7	55.0	57.0	59.6	53.9	49.8	39.4	36.8	18.2
09:00 - 10:00	59.3	76.4	51.0	64.0	55.4	55.5	58.5	54.5	50.0	42.1	42.3	22.5
10:00 - 11:00	59.2	78.2	49.0	63.7	55.3	54.7	58.1	54.1	49.5	46.5	44.5	22.9
11:00 - 12:00	56.4	75.0	48.0	63.2	54.1	52.9	55.3	51.6	47.0	41.9	39.7	19.5
12:00 - 13:00	55.7	73.8	48.0	62.2	53.1	52.0	54.6	51.1	46.3	39.9	36.7	16.5
13:00 - 14:00	56.2	78.8	47.0	63.0	53.5	51.9	54.4	50.9	46.3	46.7	44.5	22.8
14:00 - 15:00	58.8	85.1	46.0	62.5	53.5	51.8	54.8	51.0	46.5	53.6	51.3	31.7
15:00 - 16:00	52.4	69.7	42.0	55.5	47.5	47.4	50.8	47.6	39.2	43.5	40.8	20.7
16:00 - 17:00	50.9	75.6	40.0	54.6	46.0	43.1	47.0	44.6	37.3	45.6	42.0	22.5
17:00 - 18:00	52.5	73.9	41.0	55.1	46.7	43.6	48.5	46.0	38.3	47.2	45.3	24.4
18:00 - 19:00	50.9	66.0	43.0	56.9	47.2	46.5	51.1	46.5	37.3	22.2	17.5	11.3
19:00 - 20:00	52.1	67.8	41.0	56.3	47.8	47.0	52.5	47.7	38.2	21.2	13.1	10.6
20:00 - 21:00	48.9	64.9	39.0	54.7	44.8	44.1	49.1	44.4	35.9	19.1	12.1	10.5
21:00 - 22:00	48.0	63.9	40.0	54.9	43.9	44.8	48.2	43.4	35.2	19.3	14.3	10.9
22:00 - 23:00	45.2	62.9	40.0	54.5	43.0	41.6	45.2	40.7	32.5	16.9	12.1	10.6

NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES

Date / Time	LAeq	LAmax	LA90	Octave Band Centre Frequency (Hz)								
				63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
23:00 - 23:15	44.5	63.3	41.0	54.9	46.5	39.4	42.6	41.3	33.6	19.1	15.9	14.6
23:15 - 23:30	43.0	58.8	41.0	53.3	43.8	38.7	39.5	40.9	31.7	18.9	15.8	14.6
23:30 - 23:45	44.5	61.8	41.0	52.3	42.1	40.6	43.1	41.5	33.1	18.9	15.7	14.6
23:45 - 00:00	44.2	49.6	42.0	52.5	40.6	38.2	41.7	41.7	33.0	18.9	15.6	14.6
00:00 - 00:15	44.1	54.9	42.0	52.6	40.3	38.4	42.1	41.4	33.1	19.1	15.5	14.6
00:15 - 00:30	46.2	59.3	43.0	51.7	40.8	40.4	44.2	43.4	35.3	19.2	15.6	14.6
00:30 - 00:45	44.2	52.4	42.0	52.4	43.4	39.5	42.3	41.5	32.0	18.4	15.6	14.6
00:45 - 01:00	44.2	54.7	42.0	51.2	40.6	38.0	42.1	41.7	32.7	18.8	15.4	14.6
01:00 - 01:15	44.5	55.9	41.0	52.5	41.8	38.2	42.2	42.1	33.1	18.4	15.6	14.6
01:15 - 01:30	43.6	49.7	41.0	49.7	39.0	38.3	41.7	41.1	31.3	18.4	15.6	14.6
01:30 - 01:45	43.0	51.6	41.0	49.3	39.0	37.7	41.1	40.4	31.2	18.3	15.6	14.6
01:45 - 02:00	43.3	54.1	41.0	48.5	39.0	38.0	41.0	40.8	32.1	21.7	22.3	16.5
02:00 - 02:15	41.7	52.4	39.0	48.5	38.5	37.4	40.8	38.5	28.6	17.1	15.2	14.5
02:15 - 02:30	41.7	56.3	39.0	47.4	38.0	37.9	40.7	38.5	28.6	17.3	15.4	14.6
02:30 - 02:45	42.6	59.1	40.0	47.8	39.7	37.9	41.0	39.7	30.7	19.2	15.4	14.6
02:45 - 03:00	43.3	50.7	40.0	48.7	40.9	40.4	42.1	40.0	31.0	19.5	15.3	14.5
03:00 - 03:15	54.0	71.6	45.0	50.5	44.8	47.4	55.7	46.5	38.1	23.0	15.8	14.6
03:15 - 03:30	45.6	52.6	43.0	48.8	41.4	40.3	43.6	42.8	34.8	24.4	17.9	14.8
03:30 - 03:45	53.5	79.6	44.0	49.2	41.1	40.2	44.3	43.3	39.4	51.3	41.4	21.8
03:45 - 04:00	49.0	69.1	43.0	49.1	39.3	38.8	42.8	42.9	36.6	44.4	40.4	23.0
04:00 - 04:15	49.2	62.9	44.0	49.7	40.4	41.1	44.6	43.6	36.5	44.1	39.5	17.5
04:15 - 04:30	52.2	66.2	45.0	50.5	41.2	41.0	45.1	44.5	38.9	48.2	45.0	22.1
04:30 - 04:45	54.9	70.9	44.0	56.1	47.8	50.8	53.5	49.0	42.5	46.8	44.8	21.5
04:45 - 05:00	54.4	72.6	44.0	55.4	48.4	49.3	52.8	47.2	40.7	48.0	45.0	21.8
05:00 - 05:15	55.1	71.9	45.0	55.5	49.6	51.2	54.2	48.4	41.3	47.8	43.4	20.6
05:15 - 05:30	54.3	69.3	45.0	54.9	46.3	48.1	52.8	47.8	43.7	46.8	42.9	20.3
05:30 - 05:45	56.3	74.9	44.0	56.4	49.1	51.8	56.4	50.4	43.0	45.5	41.0	18.8
05:45 - 06:00	51.9	67.2	45.0	54.4	45.5	46.7	50.8	45.8	41.8	43.4	38.6	17.9
06:00 - 06:15	56.5	71.7	47.0	58.2	50.6	52.4	56.3	50.0	42.7	47.3	46.2	24.2
06:15 - 06:30	56.6	70.6	49.0	58.6	50.8	53.3	56.9	51.6	42.7	42.8	35.5	16.2
06:30 - 06:45	57.9	70.5	49.0	61.2	52.4	53.8	57.1	51.6	43.9	50.0	46.3	23.3
06:45 - 07:00	56.2	76.3	48.0	60.5	51.9	52.9	55.8	49.8	42.1	47.8	43.9	26.0



17.3 25th – 26th February 2023 Position 1

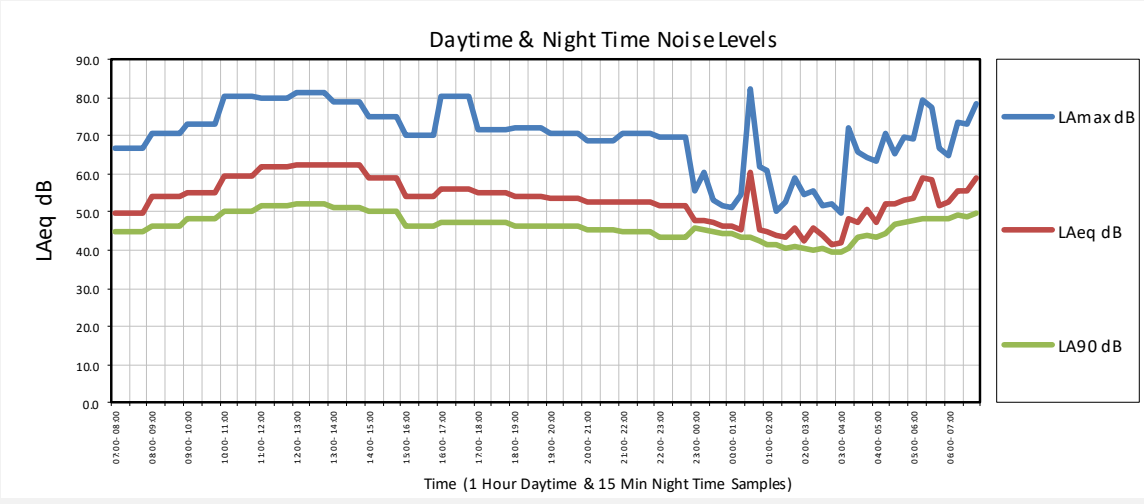
NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)							
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LAeq 16 HOUR & Corresponding LAmax 16 HOUR	57.6	81.4	46.0	61.0	52.7	55.0	57.2	52.0	47.4	42.9	41.1	21.0
NIGHT TIME 23:00 - 07:00 LAeq 8 HOUR & Corresponding LAmax 8 HOUR	52.6	82.0	40.0	55.0	46.8	49.5	48.7	46.1	45.0	44.7	42.4	20.5

DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES

Date / Time	LAeq	LAmax	LA90	Octave Band Centre Frequency (Hz)								
				63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
07:00 - 08:00	49.6	66.7	45.0	53.9	44.7	44.7	49.3	44.2	36.8	38.2	35.2	15.0
08:00 - 09:00	54.2	70.5	46.0	58.4	50.3	48.3	53.6	48.8	43.4	42.6	39.0	20.1
09:00 - 10:00	55.1	72.9	48.0	60.6	51.3	49.6	53.9	50.0	46.2	42.1	40.4	20.1
10:00 - 11:00	59.3	80.4	50.0	62.7	54.1	55.7	58.9	53.7	49.7	45.5	43.4	21.4
11:00 - 12:00	61.8	79.7	52.0	64.2	55.9	59.1	61.7	56.2	52.6	41.6	35.3	20.1
12:00 - 13:00	62.2	81.4	52.0	64.6	56.3	58.3	62.1	56.7	52.5	44.2	41.7	23.5
13:00 - 14:00	62.1	78.9	51.0	64.3	56.0	57.5	62.0	56.6	52.4	46.3	43.8	22.5
14:00 - 15:00	59.0	75.0	50.0	62.3	54.1	55.0	58.7	53.7	49.3	43.4	40.6	24.3
15:00 - 16:00	54.0	69.9	46.0	57.5	48.2	50.4	54.0	48.6	41.7	40.4	40.5	19.7
16:00 - 17:00	56.1	80.0	47.0	58.9	50.5	53.6	53.9	49.0	41.9	48.9	48.9	27.5
17:00 - 18:00	55.2	71.6	47.0	59.7	51.6	54.8	53.1	48.4	46.1	46.1	43.0	21.9
18:00 - 19:00	54.0	72.1	46.0	59.8	52.4	55.8	53.7	48.7	39.6	19.9	12.8	10.6
19:00 - 20:00	53.5	70.4	46.0	59.6	51.9	55.1	53.1	48.3	39.1	19.1	12.3	10.5
20:00 - 21:00	52.7	68.5	45.0	58.1	51.0	54.5	52.4	47.6	38.2	24.4	14.4	10.7
21:00 - 22:00	52.7	70.3	45.0	58.9	51.1	54.2	52.3	47.6	38.3	19.0	14.9	10.9
22:00 - 23:00	51.8	69.4	44.0	58.5	50.1	52.5	51.6	46.9	37.2	18.3	13.5	10.6

NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES

Date / Time	LAeq	LAmax	LA90	Octave Band Centre Frequency (Hz)								
				63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
23:00 - 23:15	47.7	55.6	46.0	55.6	44.3	43.4	45.8	45.0	36.0	21.5	18.6	14.8
23:15 - 23:30	47.6	60.3	45.0	53.5	42.9	44.7	45.7	44.8	36.3	22.5	19.7	14.9
23:30 - 23:45	47.1	53.1	45.0	53.1	42.3	43.0	45.4	44.4	35.3	20.9	17.4	14.7
23:45 - 00:00	46.1	51.6	44.0	53.2	42.7	41.4	44.2	43.5	34.5	19.7	16.5	14.6
00:00 - 00:15	46.3	51.1	45.0	52.6	41.6	41.3	44.2	43.8	35.0	21.0	17.4	14.7
00:15 - 00:30	45.4	54.5	43.0	51.5	40.7	41.7	43.6	42.6	34.0	20.0	17.5	14.7
00:30 - 00:45	60.3	82.0	43.0	63.4	56.1	60.5	58.5	55.7	51.6	37.9	18.9	14.9
00:45 - 01:00	45.2	61.9	43.0	51.3	40.9	41.7	43.7	42.0	34.4	22.0	17.1	14.6
01:00 - 01:15	44.7	60.8	42.0	50.4	39.9	40.9	42.9	41.8	33.8	21.2	18.7	14.8
01:15 - 01:30	43.7	50.0	41.0	50.3	38.7	39.7	42.0	40.8	32.5	19.9	17.5	14.7
01:30 - 01:45	43.2	52.5	40.0	48.8	39.6	39.8	41.5	40.4	31.4	20.9	19.2	14.8
01:45 - 02:00	46.0	59.0	41.0	50.2	43.1	41.1	44.5	42.8	35.8	21.3	16.9	14.6
02:00 - 02:15	42.5	54.3	40.0	48.8	39.7	40.4	41.7	38.8	29.5	18.5	16.6	14.6
02:15 - 02:30	45.8	55.3	40.0	48.4	43.9	43.6	46.5	41.0	31.5	17.9	15.9	14.6
02:30 - 02:45	43.6	51.6	40.0	49.6	39.0	40.7	43.2	39.8	31.2	20.9	16.4	14.6
02:45 - 03:00	41.5	52.0	40.0	47.6	38.1	38.7	40.5	38.0	28.2	20.9	16.3	14.6
03:00 - 03:15	41.9	49.8	40.0	48.4	39.2	38.6	40.6	38.8	29.7	19.4	15.6	14.5
03:15 - 03:30	48.2	71.9	40.0	49.5	42.3	39.9	42.1	44.7	42.2	35.7	23.3	15.3
03:30 - 03:45	47.4	65.5	44.0	50.3	42.6	42.4	45.9	42.6	34.0	39.3	34.1	16.5
03:45 - 04:00	50.8	64.1	44.0	51.9	43.4	40.0	43.4	42.7	38.4	47.2	42.4	20.0
04:00 - 04:15	47.2	63.1	43.0	50.0	40.8	40.5	42.6	42.1	35.1	41.7	35.7	16.1
04:15 - 04:30	52.2	70.6	44.0	51.1	42.2	40.9	43.8	43.3	37.5	48.3	46.9	23.2
04:30 - 04:45	52.3	65.0	47.0	52.9	44.3	44.3	46.6	44.9	39.4	47.9	44.5	21.6
04:45 - 05:00	53.3	69.7	47.0	52.8	43.4	45.6	48.0	45.2	39.4	49.1	46.2	23.0
05:00 - 05:15	53.4	69.3	48.0	53.7	44.9	46.6	47.8	45.8	39.5	48.9	46.4	22.9
05:15 - 05:30	58.9	79.2	48.0	54.8	45.5	45.5	47.3	46.1	55.8	51.0	45.8	24.9
05:30 - 05:45	58.2	77.3	48.0	55.4	45.2	44.8	46.8	46.4	55.0	50.3	44.1	23.4
05:45 - 06:00	51.7	66.6	48.0	55.4	45.5	45.0	46.9	46.3	38.8	46.4	41.7	19.9
06:00 - 06:15	52.5	64.6	48.0	56.1	46.2	45.0	47.1	46.3	42.5	46.6	45.2	24.7
06:15 - 06:30	55.4	73.6	49.0	58.3	49.7	52.9	52.0	48.3	40.4	49.6	47.5	27.4
06:30 - 06:45	55.5	72.8	49.0	59.8	52.0	54.9	53.1	49.6	40.1	47.7	45.7	24.7
06:45 - 07:00	58.7	78.5	50.0	61.9	55.1	58.5	56.4	51.5	41.8	50.0	52.2	25.9

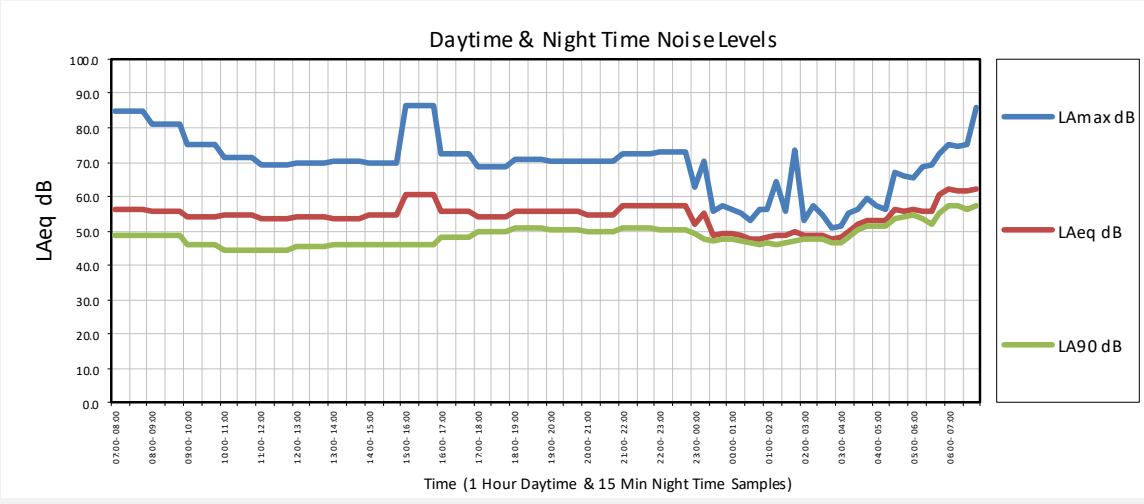


17.4 26th – 27th February 2023 Position 1

NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LAeq 16 HOUR & Corresponding LAmax 16 HOUR	55.9	86.3	46.0	60.9	53.4	56.7	54.4	49.1	41.1	47.9	42.6	23.1
NIGHT TIME 23:00 - 07:00 LAeq 8 HOUR & Corresponding LAmax 8 HOUR	55.7	85.9	47.0	62.2	53.8	57.1	55.5	50.0	40.3	38.8	37.2	17.9

DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
07:00 - 08:00	56.0	85.0	49.0	57.3	50.0	53.9	51.7	48.5	42.6	51.5	46.1	29.0
08:00 - 09:00	55.5	81.2	48.0	59.1	51.8	55.3	53.2	48.8	41.0	48.2	45.8	26.2
09:00 - 10:00	54.2	75.3	46.0	60.9	53.0	55.8	53.3	47.9	41.3	41.3	40.1	23.1
10:00 - 11:00	54.5	71.3	44.0	63.1	54.9	56.3	54.4	48.4	38.9	34.8	31.4	13.5
11:00 - 12:00	53.4	69.1	45.0	61.0	53.0	54.7	53.4	47.7	38.3	30.1	27.2	11.8
12:00 - 13:00	53.9	69.9	45.0	62.2	53.8	55.3	53.5	47.8	38.8	39.9	36.8	18.8
13:00 - 14:00	53.6	70.4	46.0	61.3	53.0	54.4	53.1	48.0	41.4	35.6	33.8	18.1
14:00 - 15:00	54.4	69.8	46.0	61.4	53.0	55.0	53.1	47.8	39.8	45.3	42.8	20.8
15:00 - 16:00	60.5	86.3	46.0	60.5	52.5	55.0	52.9	47.8	45.3	57.8	51.6	30.1
16:00 - 17:00	55.8	72.2	48.0	60.6	52.2	55.9	53.2	48.0	43.1	49.7	42.5	25.9
17:00 - 18:00	54.2	68.7	50.0	59.3	51.4	55.5	53.0	48.8	40.0	42.1	40.0	19.0
18:00 - 19:00	55.7	70.8	51.0	60.8	53.8	57.6	55.5	50.4	40.2	23.0	14.0	10.7
19:00 - 20:00	55.9	70.0	50.0	60.1	54.0	57.9	55.8	50.4	40.3	21.2	13.2	10.6
20:00 - 21:00	54.9	70.5	50.0	59.2	52.7	57.0	54.8	49.4	38.9	20.1	12.8	10.5
21:00 - 22:00	57.6	72.4	51.0	62.3	56.3	60.9	57.2	51.5	41.0	23.9	21.8	13.8
22:00 - 23:00	57.2	72.8	50.0	62.3	55.0	59.4	57.0	51.7	39.8	20.0	12.0	10.5

NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
23:00 - 23:15	52.0	62.5	49.0	57.7	48.9	53.1	50.7	48.0	39.4	26.3	26.2	18.6
23:15 - 23:30	55.4	70.2	48.0	61.1	55.0	58.4	55.0	49.4	40.3	29.3	28.7	20.0
23:30 - 23:45	48.5	55.6	47.0	56.1	45.6	49.0	46.6	45.0	37.2	22.2	16.0	14.7
23:45 - 00:00	49.5	57.2	48.0	56.2	46.5	50.6	48.8	45.1	35.5	19.5	15.2	14.6
00:00 - 00:15	49.5	56.1	48.0	56.6	48.4	50.9	48.3	45.2	36.1	20.5	15.3	14.6
00:15 - 00:30	48.5	55.4	47.0	55.7	46.1	49.8	47.5	44.3	34.7	19.3	15.1	14.6
00:30 - 00:45	47.7	53.2	47.0	55.5	45.9	49.4	46.6	43.4	33.8	19.2	15.1	14.6
00:45 - 01:00	47.6	56.1	46.0	55.3	45.4	48.6	46.3	43.4	34.8	20.4	15.2	14.6
01:00 - 01:15	48.0	56.4	46.0	54.7	46.0	49.3	46.4	43.8	36.0	22.6	16.6	14.8
01:15 - 01:30	48.5	64.4	46.0	54.0	45.6	48.6	47.3	44.4	37.4	22.5	16.0	14.6
01:30 - 01:45	48.6	55.7	47.0	54.4	45.2	48.7	46.5	45.1	37.4	21.9	15.3	14.6
01:45 - 02:00	49.9	73.6	47.0	54.9	46.7	50.4	48.0	45.9	39.8	25.1	15.4	14.6
02:00 - 02:15	48.8	53.0	47.0	55.6	46.3	49.4	47.2	45.1	36.2	20.4	15.1	14.6
02:15 - 02:30	48.8	57.5	48.0	54.4	45.8	49.1	47.0	45.1	37.8	22.2	15.2	14.6
02:30 - 02:45	48.5	54.6	47.0	54.3	47.3	49.3	47.1	44.5	35.9	20.2	15.1	14.6
02:45 - 03:00	47.8	50.7	47.0	54.2	47.7	48.8	46.3	43.8	34.6	18.8	15.2	14.6
03:00 - 03:15	48.0	51.5	47.0	54.4	47.2	48.6	46.6	44.0	35.3	20.0	15.4	14.6
03:15 - 03:30	49.6	55.1	48.0	55.5	47.2	49.5	47.9	46.2	38.0	22.3	15.3	14.6
03:30 - 03:45	52.2	56.2	50.0	57.6	49.0	51.8	50.6	48.8	39.7	24.6	15.5	14.6
03:45 - 04:00	52.8	59.6	51.0	57.6	49.6	52.8	50.9	49.5	40.5	25.0	15.5	14.6
04:00 - 04:15	52.8	57.6	52.0	57.1	50.5	53.0	51.4	49.2	39.4	24.1	17.4	14.7
04:15 - 04:30	53.0	56.5	52.0	61.2	54.4	52.5	51.3	49.5	39.6	26.0	19.4	15.0
04:30 - 04:45	56.1	66.9	53.0	67.3	56.9	56.8	55.1	51.7	41.2	31.0	21.3	14.7
04:45 - 05:00	55.7	66.1	54.0	65.7	57.3	56.4	54.2	51.8	41.3	32.0	22.5	14.7
05:00 - 05:15	56.5	65.5	55.0	62.7	56.7	58.7	55.6	51.8	40.6	34.2	26.5	14.8
05:15 - 05:30	55.7	68.6	54.0	64.1	56.3	58.6	54.7	50.4	39.3	39.9	36.3	17.0
05:30 - 05:45	55.9	69.1	52.0	61.8	53.7	56.4	56.1	49.0	38.9	42.4	39.9	18.9
05:45 - 06:00	60.6	72.4	55.0	63.1	54.8	57.4	62.5	51.7	41.3	39.8	35.0	16.7
06:00 - 06:15	62.2	75.0	57.0	69.5	58.9	63.8	62.1	56.7	46.4	36.5	30.6	15.4
06:15 - 06:30	61.7	74.7	57.0	66.6	58.7	64.8	62.2	54.3	44.2	43.2	39.8	19.2
06:30 - 06:45	61.9	75.2	57.0	67.8	60.4	64.5	61.7	55.2	44.9	45.8	44.6	22.3
06:45 - 07:00	62.1	85.9	57.0	68.3	59.6	62.1	61.7	55.5	46.7	51.2	50.4	28.1

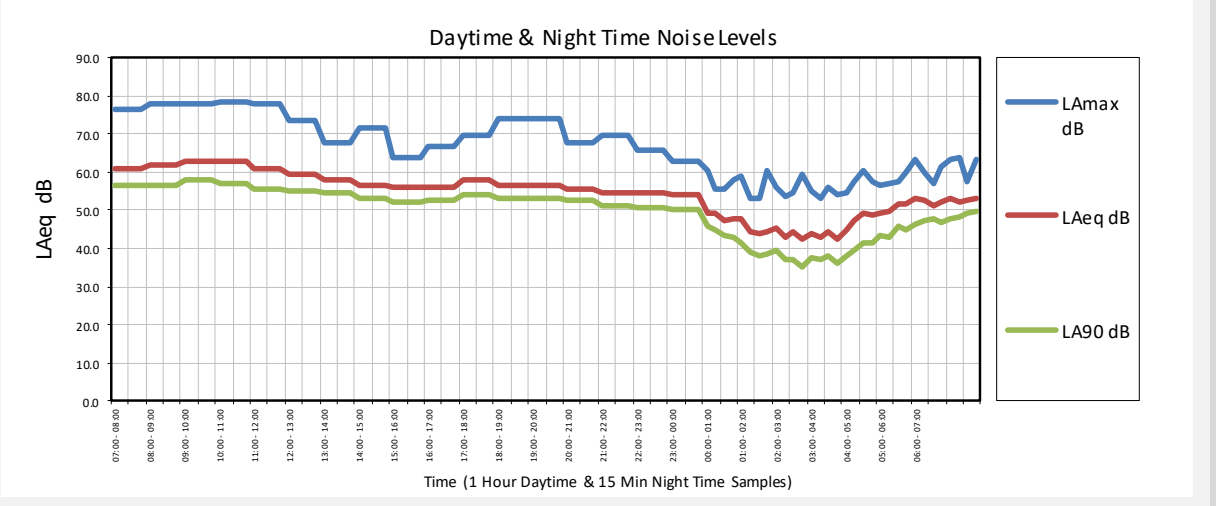


17.5 23rd – 24th February 2023 Position 2

NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)							
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LAeq 16 HOUR & Corresponding LAmax 16 HOUR	59.0	78.1	53.0	61.5	56.1	54.8	54.7	55.9	50.5	45.9	41.3	21.4
NIGHT TIME 23:00 - 07:00 LAeq 8 HOUR & Corresponding LAmax 8 HOUR	49.3	63.9	38.0	51.7	44.7	43.2	42.8	46.2	41.4	39.0	35.0	14.1

DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES				Octave Band Centre Frequency (Hz)							
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
07:00 - 08:00	61.0	49.9	56.3	62.3	56.8	56.6	56.2	57.4	53.4	50.1	45.2	29.6
08:00 - 09:00	61.8	78.0	56.6	62.0	57.5	56.9	57.4	58.1	52.8	52.1	48.3	23.6
09:00 - 10:00	62.6	77.6	57.9	62.4	58.0	58.2	59.2	59.5	54.1	48.1	42.1	20.6
10:00 - 11:00	63.0	78.1	57.2	62.9	59.7	58.9	59.7	59.9	54.3	48.1	42.3	19.8
11:00 - 12:00	60.8	77.7	55.4	61.9	57.6	56.6	57.3	57.8	52.2	45.6	38.3	18.6
12:00 - 13:00	59.3	73.5	55.0	62.0	57.0	54.6	54.3	56.1	50.8	47.6	44.1	23.1
13:00 - 14:00	57.7	67.5	54.3	62.7	56.4	53.7	52.3	55.0	49.6	43.1	36.5	18.1
14:00 - 15:00	56.7	71.3	53.2	61.0	55.6	53.0	51.3	53.9	48.3	42.8	37.6	18.0
15:00 - 16:00	55.7	63.9	52.3	60.4	53.0	51.5	50.3	53.3	47.7	38.4	30.8	14.6
16:00 - 17:00	56.2	66.6	52.6	61.8	54.1	52.3	51.0	53.7	47.8	38.7	29.3	14.5
17:00 - 18:00	57.8	69.8	53.8	61.8	56.2	54.1	51.8	54.6	48.5	47.9	45.0	24.4
18:00 - 19:00	56.5	74.0	53.1	62.2	56.1	53.6	52.2	53.9	47.6	37.8	29.1	14.9
19:00 - 20:00	55.3	67.6	52.4	60.1	53.0	51.5	50.4	52.8	46.6	36.5	26.8	16.9
20:00 - 21:00	54.6	69.5	51.0	61.6	53.3	51.2	50.1	52.0	45.7	36.4	28.3	15.3
21:00 - 22:00	54.5	65.6	50.7	58.1	51.2	50.5	49.4	52.2	46.0	35.4	25.5	13.9
22:00 - 23:00	54.0	63.0	50.3	58.6	52.3	50.1	49.0	51.5	45.7	35.7	27.3	12.2

NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES				Octave Band Centre Frequency (Hz)							
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
23:00 - 23:15	49.3	60.4	45.8	55.1	49.9	46.6	45.1	46.4	40.8	30.3	19.9	7.3
23:15 - 23:30	49.0	55.7	45.0	52.2	45.2	45.2	44.0	46.6	40.6	29.6	19.0	5.6
23:30 - 23:45	47.3	55.4	43.3	51.2	43.5	42.3	42.6	44.8	39.0	28.7	18.2	6.7
23:45 - 00:00	47.9	57.7	42.9	51.8	43.3	42.4	42.7	45.5	40.0	29.2	20.4	7.0
00:00 - 00:15	47.8	58.7	41.5	53.1	47.8	43.5	42.4	45.2	40.0	29.8	19.0	6.4
00:15 - 00:30	44.2	53.3	39.2	49.0	41.6	39.6	39.6	41.5	36.0	26.2	15.8	5.5
00:30 - 00:45	43.7	53.1	37.9	48.6	42.3	39.0	38.6	41.0	35.7	26.3	15.4	5.0
00:45 - 01:00	44.5	60.5	38.3	49.2	43.1	39.3	39.0	41.8	36.3	30.3	25.7	11.9
01:00 - 01:15	45.3	55.9	39.3	48.4	43.5	40.1	39.7	42.7	37.4	29.8	17.6	5.0
01:15 - 01:30	42.8	53.5	36.8	47.0	42.7	38.4	38.0	40.0	34.6	28.3	16.1	4.7
01:30 - 01:45	44.2	54.7	37.1	47.5	40.4	38.9	39.1	41.8	35.9	27.5	15.9	5.2
01:45 - 02:00	42.5	59.3	35.0	45.2	41.0	39.4	37.9	39.2	34.9	29.4	21.1	7.2
02:00 - 02:15	43.9	54.9	37.8	44.1	38.9	38.2	38.1	41.0	36.5	30.6	27.2	15.5
02:15 - 02:30	42.9	53.1	37.1	45.7	37.1	36.8	37.1	40.4	35.1	28.1	20.0	9.3
02:30 - 02:45	44.5	55.9	38.1	47.0	39.3	37.8	38.4	42.0	36.9	29.1	20.3	7.9
02:45 - 03:00	42.4	54.2	36.3	39.4	34.6	35.9	36.5	39.9	34.9	27.4	17.5	6.5
03:00 - 03:15	44.7	54.7	37.9	46.9	39.4	38.6	38.8	42.2	37.1	29.4	20.4	7.4
03:15 - 03:30	47.3	57.6	39.5	48.0	38.8	39.3	39.7	44.8	40.6	30.6	20.0	6.8
03:30 - 03:45	49.3	60.3	41.5	50.6	43.1	41.0	41.7	47.1	42.3	32.5	21.5	7.5
03:45 - 04:00	48.8	57.6	41.6	47.2	44.8	41.2	41.1	46.4	42.0	32.1	21.2	6.4
04:00 - 04:15	49.1	56.5	43.2	49.7	42.2	41.5	41.5	46.5	42.5	32.7	22.3	6.8
04:15 - 04:30	49.6	57.1	42.8	52.3	41.0	41.8	42.1	47.3	42.6	32.6	21.5	6.4
04:30 - 04:45	51.5	57.2	45.9	51.9	43.4	43.9	44.2	49.1	44.6	34.6	24.3	7.4
04:45 - 05:00	51.6	59.7	44.9	51.4	43.7	42.8	42.5	46.6	42.4	46.2	42.1	20.6
05:00 - 05:15	53.0	63.3	46.3	52.1	43.7	43.4	43.3	47.5	43.1	48.0	44.7	22.3
05:15 - 05:30	52.3	59.7	47.3	54.0	45.8	44.7	44.7	48.9	44.5	43.6	40.2	18.1
05:30 - 05:45	51.1	57.0	47.5	53.6	45.9	45.1	44.7	48.7	43.9	34.4	24.3	11.9
05:45 - 06:00	52.2	61.2	47.0	53.9	47.8	45.9	45.1	48.6	43.6	43.9	39.5	18.1
06:00 - 06:15	53.1	63.3	47.8	54.3	47.5	46.9	46.6	48.6	43.5	46.4	43.3	22.0
06:15 - 06:30	52.2	63.9	48.3	55.8	48.2	46.5	45.7	49.0	44.3	42.4	38.5	17.9
06:30 - 06:45	52.5	57.6	49.2	55.7	48.3	47.4	47.1	49.8	45.0	35.6	27.1	9.2
06:45 - 07:00	53.1	63.4	49.8	56.7	49.0	48.0	47.3	50.2	45.3	39.8	35.7	12.8

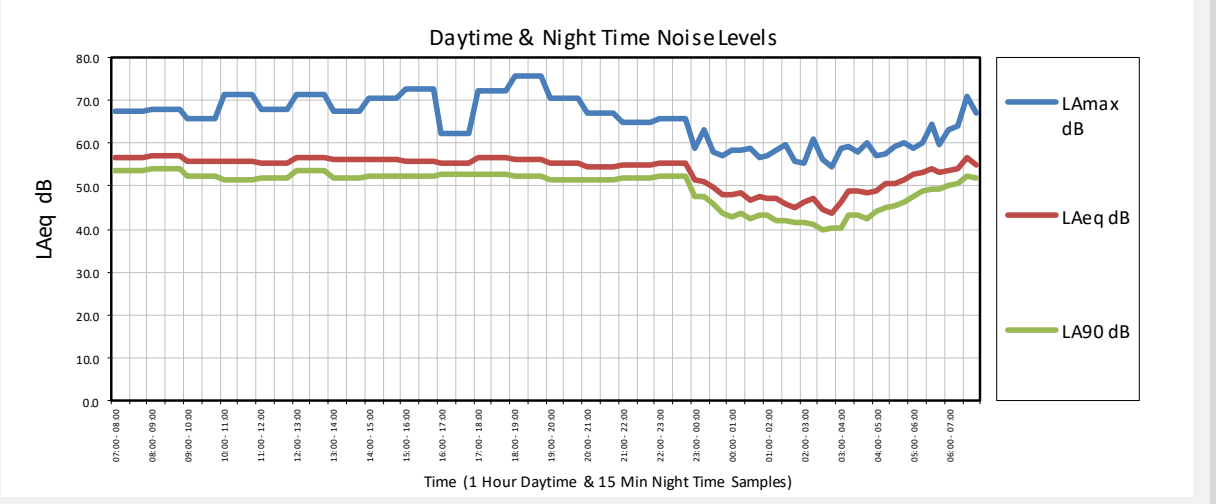


17.6 24th – 25th February 2023 Position 2

NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)							
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LAeq 16 HOUR & Corresponding LAmax 16 HOUR	55.9	75.8	52.0	60.9	55.3	53.0	51.4	53.1	47.3	40.1	34.7	17.2
NIGHT TIME 23:00 - 07:00 LAeq 8 HOUR & Corresponding LAmax 8 HOUR	50.8	70.8	43.0	53.2	47.7	47.4	46.3	47.9	41.4	38.7	32.9	12.2

DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
07:00 - 08:00	56.8	67.5	53.8	61.5	54.8	53.1	51.6	54.0	49.0	41.2	34.7	16.5
08:00 - 09:00	57.3	67.8	54.1	61.0	54.3	52.6	51.6	54.4	49.3	44.1	40.3	21.6
09:00 - 10:00	55.7	65.6	52.2	61.0	54.6	52.2	50.9	52.9	47.5	39.2	32.3	16.9
10:00 - 11:00	55.7	71.4	51.7	61.0	56.6	53.6	51.9	52.7	46.5	38.3	32.5	16.6
11:00 - 12:00	55.3	67.8	51.7	61.8	56.2	53.1	51.1	52.4	46.4	38.0	32.5	17.2
12:00 - 13:00	56.8	71.4	53.6	61.2	57.7	54.5	52.2	53.3	48.6	43.9	39.0	22.2
13:00 - 14:00	56.1	67.6	51.9	61.3	54.9	53.2	51.7	53.3	47.0	41.1	35.4	16.3
14:00 - 15:00	56.0	70.4	52.5	61.1	56.4	53.5	51.6	53.3	47.2	38.4	31.0	14.6
15:00 - 16:00	56.0	72.7	52.3	61.1	55.6	53.1	51.5	52.9	47.3	42.3	37.4	18.5
16:00 - 17:00	55.5	62.4	52.7	61.7	54.5	52.0	50.7	52.9	47.1	37.2	30.3	16.5
17:00 - 18:00	56.5	72.0	52.7	61.5	56.1	55.1	51.9	53.4	47.4	42.7	38.6	18.4
18:00 - 19:00	56.2	75.8	52.3	62.1	55.4	52.9	51.2	53.6	48.1	36.6	26.0	14.1
19:00 - 20:00	55.2	70.4	51.6	60.7	55.4	53.2	51.5	52.3	46.1	35.9	25.5	13.4
20:00 - 21:00	54.6	67.1	51.4	58.5	52.3	51.2	50.4	52.0	45.5	35.6	26.9	12.3
21:00 - 22:00	54.9	64.8	51.9	58.6	52.0	50.9	50.4	52.6	45.9	35.2	24.1	11.0
22:00 - 23:00	55.5	65.7	52.2	58.8	53.5	52.6	51.7	53.0	46.0	35.4	24.8	11.1

NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
23:00 - 23:15	51.3	58.9	47.8	54.5	48.4	47.7	47.1	48.9	42.2	31.6	19.7	6.2
23:15 - 23:30	51.2	63.1	47.7	53.1	46.0	46.6	47.0	48.8	42.1	31.1	19.9	7.0
23:30 - 23:45	49.5	58.1	45.9	52.4	46.2	44.0	44.7	47.2	41.1	30.5	17.9	5.7
23:45 - 00:00	48.2	57.0	43.9	51.6	43.9	43.6	43.7	45.7	39.4	29.6	21.7	6.5
00:00 - 00:15	47.8	58.4	42.9	53.0	46.7	44.5	42.7	45.3	39.5	28.8	17.1	5.9
00:15 - 00:30	48.5	58.3	43.6	52.2	45.9	43.8	42.8	46.2	40.2	29.6	17.4	5.6
00:30 - 00:45	46.9	58.8	42.5	50.0	42.8	42.4	42.4	44.5	38.4	28.9	18.1	5.6
00:45 - 01:00	47.7	56.8	43.1	47.9	42.1	42.7	43.1	45.4	39.0	27.6	14.4	4.9
01:00 - 01:15	47.3	57.2	43.2	48.2	41.4	42.6	42.9	45.1	38.1	26.3	23.4	5.3
01:15 - 01:30	47.2	58.4	42.1	49.8	43.4	42.8	42.5	44.9	38.1	27.1	14.7	6.0
01:30 - 01:45	46.0	59.8	41.8	48.5	40.8	40.7	41.1	43.9	36.7	28.9	15.6	4.6
01:45 - 02:00	45.1	55.6	41.4	46.5	39.7	41.2	41.0	42.7	35.5	28.7	14.9	4.3
02:00 - 02:15	46.2	55.5	41.4	49.5	44.0	43.1	42.2	43.6	36.9	29.2	18.1	6.6
02:15 - 02:30	47.0	61.0	41.2	49.8	42.7	42.9	43.0	44.6	37.4	30.4	20.1	7.6
02:30 - 02:45	44.8	56.4	39.8	47.4	41.1	41.1	40.5	42.4	34.8	28.3	15.7	7.2
02:45 - 03:00	43.7	54.4	40.1	43.8	38.3	40.3	39.6	41.4	33.4	26.8	13.7	4.3
03:00 - 03:15	46.1	58.7	40.2	48.9	41.5	40.5	40.8	43.7	38.0	30.6	20.9	6.6
03:15 - 03:30	48.7	59.3	43.3	48.0	41.9	42.2	42.5	46.7	40.6	30.8	16.6	4.5
03:30 - 03:45	48.7	58.1	43.3	50.2	43.3	42.8	42.9	46.5	40.4	31.2	21.8	5.3
03:45 - 04:00	48.6	60.3	42.4	48.6	40.9	41.9	42.1	46.5	40.6	31.0	17.8	4.6
04:00 - 04:15	48.9	57.3	44.3	49.0	42.1	43.1	42.7	47.0	40.5	31.0	17.9	4.9
04:15 - 04:30	50.4	57.5	45.0	52.4	43.8	44.3	44.2	48.3	42.4	32.3	18.9	9.7
04:30 - 04:45	50.7	59.2	45.3	50.7	45.7	45.0	44.8	48.7	42.3	32.4	19.6	5.1
04:45 - 05:00	51.7	60.3	46.3	53.0	45.9	45.6	45.4	48.5	42.7	42.8	36.9	15.2
05:00 - 05:15	52.9	58.9	47.7	53.1	46.0	46.6	45.6	48.9	42.9	46.7	41.4	19.4
05:15 - 05:30	53.2	59.9	49.0	54.5	47.0	52.1	46.8	49.2	43.2	45.7	40.0	18.3
05:30 - 05:45	54.1	64.4	49.3	58.6	52.6	49.9	48.3	50.1	44.1	46.7	41.7	20.3
05:45 - 06:00	53.3	59.7	49.2	53.6	47.6	48.6	47.5	49.7	43.4	45.8	40.7	19.3
06:00 - 06:15	53.6	63.3	50.1	55.1	49.3	51.4	50.8	50.5	43.3	38.1	32.3	12.6
06:15 - 06:30	54.1	64.2	50.4	59.6	55.8	52.8	50.3	50.9	43.8	40.3	34.6	13.8
06:30 - 06:45	56.6	70.8	52.1	57.5	55.1	54.9	53.9	53.6	46.6	38.3	29.7	9.0
06:45 - 07:00	54.9	66.8	51.8	58.0	51.8	52.8	52.0	52.2	44.9	33.8	22.6	6.4

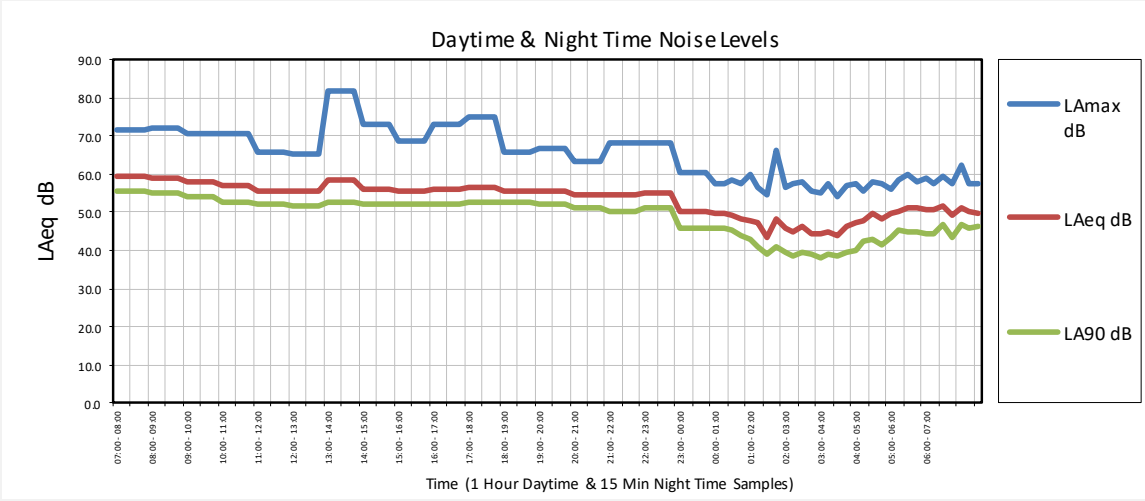


17.7 25th – 26th February 2023 Position 2

NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)							
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LAeq 16 HOUR & Corresponding LAmax 16 HOUR	56.6	81.5	52.0	61.3	55.2	53.3	52.1	53.6	47.9	42.0	37.3	16.5
NIGHT TIME 23:00 - 07:00 LAeq 8 HOUR & Corresponding LAmax 8 HOUR	48.8	66.2	39.0	51.6	45.0	43.3	42.8	45.9	40.6	37.3	32.2	11.9

DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
07:00 - 08:00	59.2	71.5	55.6	62.4	57.4	56.7	55.4	55.9	49.4	47.1	43.8	18.9
08:00 - 09:00	58.9	71.8	55.0	62.5	57.0	56.3	55.1	55.9	49.2	44.4	39.2	17.6
09:00 - 10:00	57.9	70.3	54.0	62.4	56.8	54.7	54.0	54.8	48.4	44.8	40.4	16.3
10:00 - 11:00	56.7	70.4	52.5	61.1	54.7	53.0	51.9	53.2	47.1	47.4	43.9	21.5
11:00 - 12:00	55.4	65.5	51.9	61.8	54.0	51.9	50.9	52.8	46.8	38.7	29.6	13.1
12:00 - 13:00	55.4	65.3	51.5	60.9	53.5	51.1	50.0	52.8	47.2	41.1	32.4	16.1
13:00 - 14:00	58.2	81.5	52.7	61.2	54.1	52.1	51.2	55.1	52.1	40.6	32.5	17.5
14:00 - 15:00	55.9	73.0	52.2	61.2	55.8	53.4	51.9	53.1	47.0	37.5	27.9	14.3
15:00 - 16:00	55.6	68.5	51.9	61.2	54.1	52.2	50.7	52.6	46.6	43.3	39.7	19.5
16:00 - 17:00	56.0	72.9	52.1	60.9	54.2	52.9	51.9	53.2	47.3	37.3	27.8	14.2
17:00 - 18:00	56.6	74.9	52.5	61.5	56.1	54.1	52.0	53.8	48.2	38.5	29.4	14.5
18:00 - 19:00	55.6	65.9	52.5	62.7	55.6	52.8	51.1	53.0	46.7	36.8	28.1	15.1
19:00 - 20:00	55.3	66.7	52.2	60.4	55.5	52.1	50.8	52.7	46.6	36.0	26.6	14.3
20:00 - 21:00	54.7	63.2	51.3	59.3	53.1	51.4	50.2	52.1	45.9	35.1	24.4	12.1
21:00 - 22:00	54.6	67.9	50.1	59.2	55.3	51.8	49.8	51.9	46.0	35.7	25.4	11.6
22:00 - 23:00	54.9	68.0	51.0	59.5	52.1	50.9	49.9	52.3	46.8	35.7	24.4	11.1

NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES				Octave Band Centre Frequency (Hz)								
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
23:00 - 23:15	50.1	60.3	45.9	53.1	46.2	45.7	44.8	47.7	42.2	31.3	19.7	5.6
23:15 - 23:30	49.6	57.3	45.6	53.1	47.2	44.3	44.1	47.2	41.6	30.8	20.4	7.3
23:30 - 23:45	49.8	57.4	45.8	54.5	46.1	44.3	44.2	47.5	41.7	30.6	18.0	9.8
23:45 - 00:00	49.1	58.2	45.1	53.7	46.2	44.9	44.0	46.6	41.1	30.6	19.2	7.4
00:00 - 00:15	48.3	57.5	44.0	51.9	44.2	43.1	42.5	45.9	40.5	28.6	16.5	5.3
00:15 - 00:30	47.7	59.8	43.1	53.9	52.5	43.7	42.6	44.9	39.4	28.7	18.4	6.5
00:30 - 00:45	47.3	56.5	41.1	51.4	43.2	42.2	42.1	44.9	39.4	28.5	17.5	8.1
00:45 - 01:00	43.4	54.5	38.9	46.3	40.6	39.7	39.1	40.7	35.1	24.0	14.7	5.4
01:00 - 01:15	48.3	66.2	40.7	50.8	49.0	47.1	45.9	44.6	39.2	28.8	18.5	5.6
01:15 - 01:30	45.8	56.3	39.3	48.0	41.7	40.7	40.0	43.3	38.3	26.6	15.5	4.9
01:30 - 01:45	44.9	57.5	38.3	47.5	40.4	39.1	39.1	42.8	36.8	26.2	14.8	5.0
01:45 - 02:00	46.1	58.1	39.2	52.2	44.9	42.6	40.4	43.4	38.5	28.5	18.5	6.5
02:00 - 02:15	44.3	55.7	38.8	48.3	40.2	39.1	38.8	41.9	36.3	26.9	15.1	5.1
02:15 - 02:30	44.5	55.2	37.8	44.2	38.6	39.1	38.8	42.0	37.1	28.2	14.8	5.3
02:30 - 02:45	44.7	57.5	38.8	45.8	39.3	39.2	39.0	42.5	36.5	27.0	14.0	4.7
02:45 - 03:00	43.7	53.9	38.5	47.1	38.9	38.8	38.5	41.3	35.7	26.4	14.9	5.3
03:00 - 03:15	46.1	57.0	39.7	46.8	40.4	41.9	40.8	43.5	38.2	29.2	18.5	5.3
03:15 - 03:30	47.1	57.4	40.1	46.4	38.6	40.0	40.4	44.9	39.7	28.6	15.0	4.6
03:30 - 03:45	47.9	55.5	42.2	46.9	40.8	41.4	41.6	45.5	40.4	29.4	15.9	4.8
03:45 - 04:00	49.4	57.7	43.1	48.5	40.6	42.2	42.8	47.2	42.0	31.3	19.0	5.1
04:00 - 04:15	48.0	57.3	41.6	48.9	41.6	42.1	41.5	45.6	40.6	30.3	18.1	5.5
04:15 - 04:30	49.5	55.9	43.5	48.4	41.3	42.2	42.5	47.3	42.2	30.9	18.1	5.9
04:30 - 04:45	50.0	58.6	45.1	54.6	45.5	44.4	43.7	47.5	42.8	31.8	19.5	5.3
04:45 - 05:00	51.3	60.1	45.0	51.0	43.8	43.4	42.8	47.2	42.2	45.2	39.7	18.2
05:00 - 05:15	51.3	57.8	44.7	52.7	43.8	42.9	42.8	46.5	41.7	45.7	41.5	19.9
05:15 - 05:30	50.7	59.1	44.4	53.4	45.1	43.7	43.2	46.8	41.7	43.8	38.9	17.8
05:30 - 05:45	50.7	57.6	44.6	54.3	45.0	44.1	44.6	48.0	42.8	38.7	33.4	12.4
05:45 - 06:00	51.7	59.2	46.7	51.6	45.0	44.0	44.0	48.3	42.7	44.2	40.1	19.1
06:00 - 06:15	49.2	57.5	43.3	51.6	44.5	43.7	43.1	45.9	40.3	40.1	36.7	15.6
06:15 - 06:30	51.1	62.3	46.6	54.7	45.9	45.4	45.0	48.0	43.0	40.3	35.7	15.5
06:30 - 06:45	50.1	57.4	45.9	54.3	47.9	46.4	45.1	47.6	41.8	30.9	20.6	7.8
06:45 - 07:00	49.8	57.3	46.3	54.3	47.8	46.4	45.3	47.1	41.6	32.7	24.0	7.1

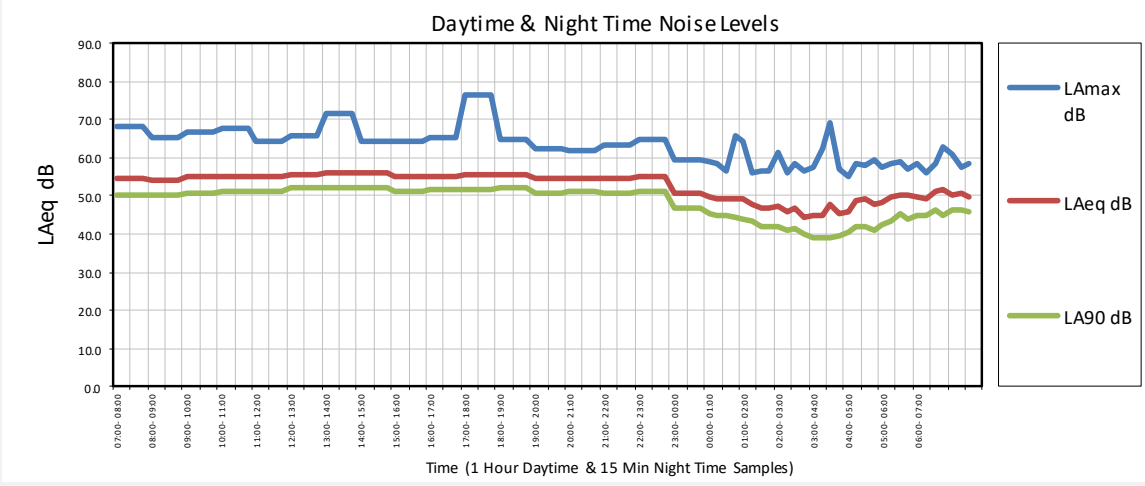


17.8 26th – 27th February 2023 Position 2

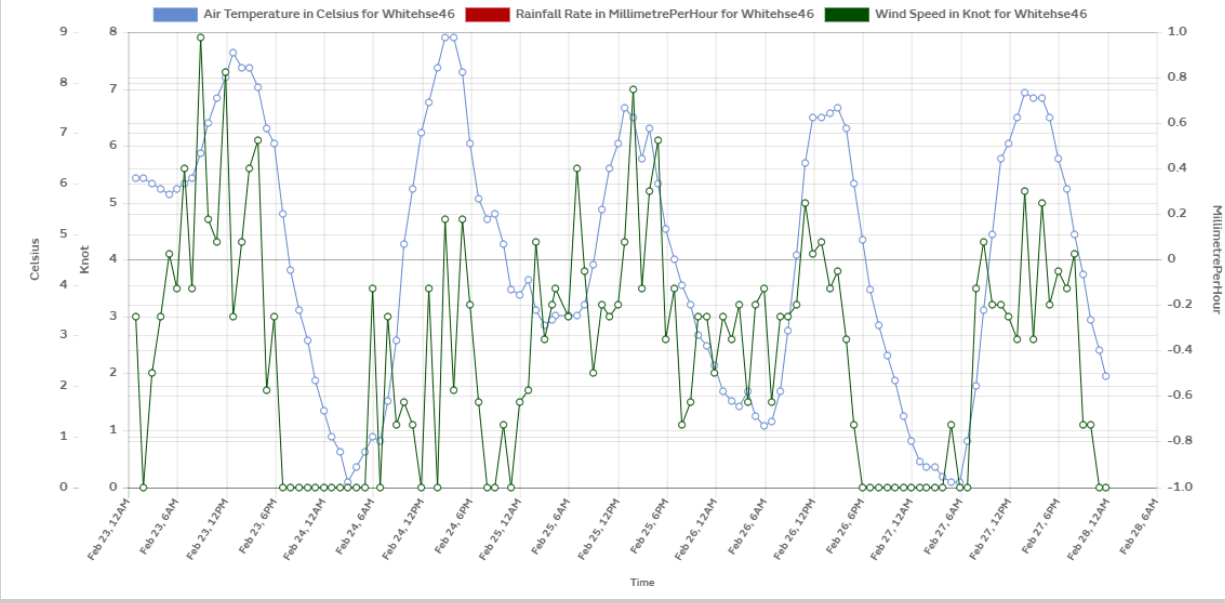
NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)							
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LAeq 16 HOUR & Corresponding LAmax 16 HOUR	55.1	76.6	51.0	60.0	54.1	51.9	50.6	52.3	46.5	38.1	32.7	16.4
NIGHT TIME 23:00 - 07:00 LAeq 8 HOUR & Corresponding LAmax 8 HOUR	48.8	69.2	45.0	51.2	45.4	44.0	42.9	46.2	40.7	35.3	29.6	10.0

DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES				Octave Band Centre Frequency (Hz)							
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
07:00 - 08:00	54.4	68.0	50.3	57.9	51.7	50.5	49.6	51.5	46.0	40.7	37.1	16.9
08:00 - 09:00	54.2	65.1	50.2	57.7	52.4	50.7	49.4	51.5	45.8	37.7	31.7	13.5
09:00 - 10:00	54.8	66.7	50.8	60.4	54.1	52.0	50.5	51.7	46.5	39.0	32.4	14.2
10:00 - 11:00	55.1	67.8	51.3	59.3	53.0	51.2	50.2	52.3	46.8	41.0	35.9	16.8
11:00 - 12:00	54.8	64.1	50.9	59.5	54.0	51.3	50.1	52.1	46.3	37.6	31.6	15.8
12:00 - 13:00	55.5	65.5	52.0	60.7	54.6	52.5	50.9	52.9	46.9	37.0	31.2	15.1
13:00 - 14:00	56.0	71.6	52.2	61.0	55.0	52.8	51.3	53.1	47.9	40.7	34.8	16.2
14:00 - 15:00	55.8	64.3	52.3	60.8	54.3	52.6	51.2	53.0	47.3	39.1	37.4	23.9
15:00 - 16:00	55.2	64.1	51.3	60.3	54.2	52.4	50.9	52.5	46.4	36.4	28.8	15.1
16:00 - 17:00	55.0	65.3	51.5	60.6	55.8	52.6	50.6	52.2	46.1	36.4	28.8	14.9
17:00 - 18:00	55.7	76.6	51.7	60.5	55.0	52.8	51.8	52.9	46.6	39.6	35.0	15.6
18:00 - 19:00	55.4	64.8	52.0	61.3	55.4	53.2	51.5	52.7	46.1	35.8	25.0	13.5
19:00 - 20:00	54.5	62.5	50.8	60.6	53.9	51.1	50.0	51.9	45.8	35.2	25.1	12.9
20:00 - 21:00	54.6	61.7	51.1	59.9	53.7	51.4	50.2	51.9	45.8	35.2	25.1	12.6
21:00 - 22:00	54.5	63.4	50.6	59.0	52.2	50.5	49.7	52.0	46.1	35.3	25.4	11.9
22:00 - 23:00	55.1	64.7	51.0	59.3	54.4	51.5	50.5	52.5	46.5	35.8	25.2	12.1

NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES				Octave Band Centre Frequency (Hz)							
Date / Time	LAeq	LAmax	LA90	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
23:00 - 23:15	50.7	59.3	46.6	56.2	50.7	46.8	45.0	48.2	42.6	31.4	20.7	6.3
23:15 - 23:30	49.9	58.8	45.3	52.3	45.2	44.5	44.9	47.6	41.5	30.7	18.4	7.2
23:30 - 23:45	49.0	58.4	45.0	54.0	46.4	44.2	43.7	46.6	40.7	30.0	18.3	7.8
23:45 - 00:00	49.3	56.7	45.0	53.5	47.0	44.6	44.7	46.7	41.0	30.5	19.5	8.4
00:00 - 00:15	49.1	65.5	44.1	51.5	46.4	43.8	43.1	46.6	40.9	36.3	20.8	6.5
00:15 - 00:30	49.4	64.2	44.1	53.9	49.8	47.4	43.8	46.8	40.9	30.0	18.6	5.9
00:30 - 00:45	47.9	55.9	43.6	51.3	44.2	42.5	42.4	45.5	39.9	29.0	17.4	7.6
00:45 - 01:00	46.7	56.4	41.9	49.1	43.3	42.9	42.2	44.2	38.2	27.9	16.0	4.6
01:00 - 01:15	46.7	56.4	42.0	48.1	43.4	42.4	42.1	44.2	38.1	28.3	16.0	5.6
01:15 - 01:30	47.1	61.1	42.0	46.6	45.4	43.7	42.0	44.7	38.4	28.8	17.1	4.9
01:30 - 01:45	45.8	56.0	40.9	46.7	42.3	42.6	41.1	43.5	37.0	27.4	14.1	4.4
01:45 - 02:00	46.9	58.6	41.2	49.1	42.9	41.4	41.2	44.6	39.1	28.7	15.8	4.7
02:00 - 02:15	44.6	56.5	40.0	46.0	40.7	39.3	39.3	42.3	36.1	26.6	14.3	7.6
02:15 - 02:30	45.0	57.3	38.9	46.3	39.5	39.2	39.3	42.8	37.2	26.3	13.5	4.4
02:30 - 02:45	44.6	62.4	38.8	47.3	39.8	39.3	39.5	42.2	36.3	28.2	15.9	4.8
02:45 - 03:00	47.9	69.2	38.9	45.0	46.7	50.7	43.0	44.8	37.5	27.4	16.3	4.8
03:00 - 03:15	45.4	56.9	39.6	47.8	44.6	39.3	39.1	43.0	37.8	27.9	15.5	4.7
03:15 - 03:30	46.0	54.9	40.7	46.9	39.9	39.4	39.6	43.7	38.5	28.0	14.8	4.4
03:30 - 03:45	48.5	58.4	41.7	48.9	41.9	41.1	41.6	46.4	41.1	30.7	18.9	5.5
03:45 - 04:00	49.3	58.1	42.0	49.2	45.3	43.2	42.8	47.0	41.8	30.5	18.4	5.9
04:00 - 04:15	47.8	59.3	41.1	47.6	40.8	41.0	41.3	45.5	40.5	30.0	17.1	4.9
04:15 - 04:30	48.1	57.4	42.2	50.7	42.6	41.5	41.4	45.9	40.7	30.1	17.8	5.6
04:30 - 04:45	49.8	58.4	43.4	51.5	44.8	43.0	43.5	47.5	42.3	32.4	20.8	6.0
04:45 - 05:00	50.2	59.0	45.4	52.2	49.0	44.4	43.3	48.0	42.7	32.0	19.4	5.0
05:00 - 05:15	50.1	56.9	44.0	52.4	46.3	43.7	43.6	47.8	42.5	31.9	19.5	5.6
05:15 - 05:30	49.6	58.3	44.8	51.1	44.6	43.1	43.1	47.3	42.1	31.3	19.1	5.7
05:30 - 05:45	49.3	56.2	44.9	53.6	44.3	43.3	43.5	46.9	41.6	31.2	20.2	6.0
05:45 - 06:00	51.3	58.6	46.2	51.6	44.4	43.7	44.0	48.3	43.3	41.7	34.3	13.0
06:00 - 06:15	51.8	62.8	44.9	50.6	43.9	43.4	43.4	46.5	41.5	46.7	43.0	21.7
06:15 - 06:30	50.3	60.6	46.1	53.2	46.0	44.6	44.2	47.1	41.6	41.3	34.3	13.4
06:30 - 06:45	50.6	57.5	46.5	53.8	46.6	45.7	45.4	48.1	42.6	33.5	23.1	6.3
06:45 - 07:00	49.8	58.4	46.0	51.6	45.4	44.7	44.6	47.4	41.4	33.7	33.8	12.7



18 APPENDIX B - ENVIRONMENTAL CONDITIONS



23rd – 27th February 2023

#END OF REPORT#