



REPORT REFERENCE:

SA – 7932/Rev1

## ENVIRONMENTAL NOISE IMPACT ASSESSMENT

### PRoPG Planning and Noise

British Standard 8233: 2014

World Health Organisation (WHO)

CLIENT:

Mr & Mrs Brennan

SITE:

Land at Willow Mead

Wildern Lane

Hedge End

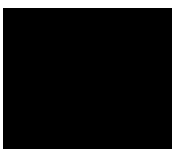
Hampshire

SO30 4RB

SURVEY DATES:

28<sup>th</sup> November – 3<sup>rd</sup> December 2024

Report By



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## 1 EXECUTIVE SUMMARY

### 1.1 Instruction

Sound Advice Acoustics Ltd have been instructed by Mr & Mrs Brennan 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 at Willow Mead, Wildern Lane, Hedge End, Hampshire, SO30 4RB.

### 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 120 hour background noise survey was undertaken from 28<sup>th</sup> November to 3<sup>rd</sup> December 2024 at one position 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          | 28/11/2024 | 03/12/2024  | 66.0         | 59.2            |

### 1.4 Potential Façade Noise Levels

#### 1.4.1 Daytime (07:00-23:00)

| Time Period                   | Highest Potential Façade Noise Level | Noise Risk Category<br>1 - Low |
|-------------------------------|--------------------------------------|--------------------------------|
| Average Daytime (07:00-23:00) | L <sub>Aeq, 16 HOUR</sub> 53 dB      | 50 – 63 dB                     |

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

| Time Period                      | Highest Potential Façade Noise Level           | Noise Risk Category<br>1 - Low |
|----------------------------------|------------------------------------------------|--------------------------------|
| Average Night Time (23:00-07:00) | L <sub>Aeq, 16 HOUR</sub> 46 dB                | 40 – 55 dB                     |
|                                  | Maximum (10 Times) – L <sub>Amax</sub> 65.6 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 night time levels. Therefore, further mitigation levels will be required at Stage 2.

## 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.

## 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. The calculation demonstrates the external living spaces are likely to see noise levels below the upper guideline of 55 dB.

## 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 2024 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 2024, NPPF & NPSE and that, with regards to sound, planning permission can be granted.

## 2 INTRODUCTION

Sound Advice Acoustics Ltd have been instructed by Mr & Mrs Brennan 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 at Willow Mead, Wildern Lane, Hedge End, Hampshire, SO30 4RB.

Ambient noise levels were measured between 28<sup>th</sup> November – 3<sup>rd</sup> December 2024. 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 2023. 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.'*

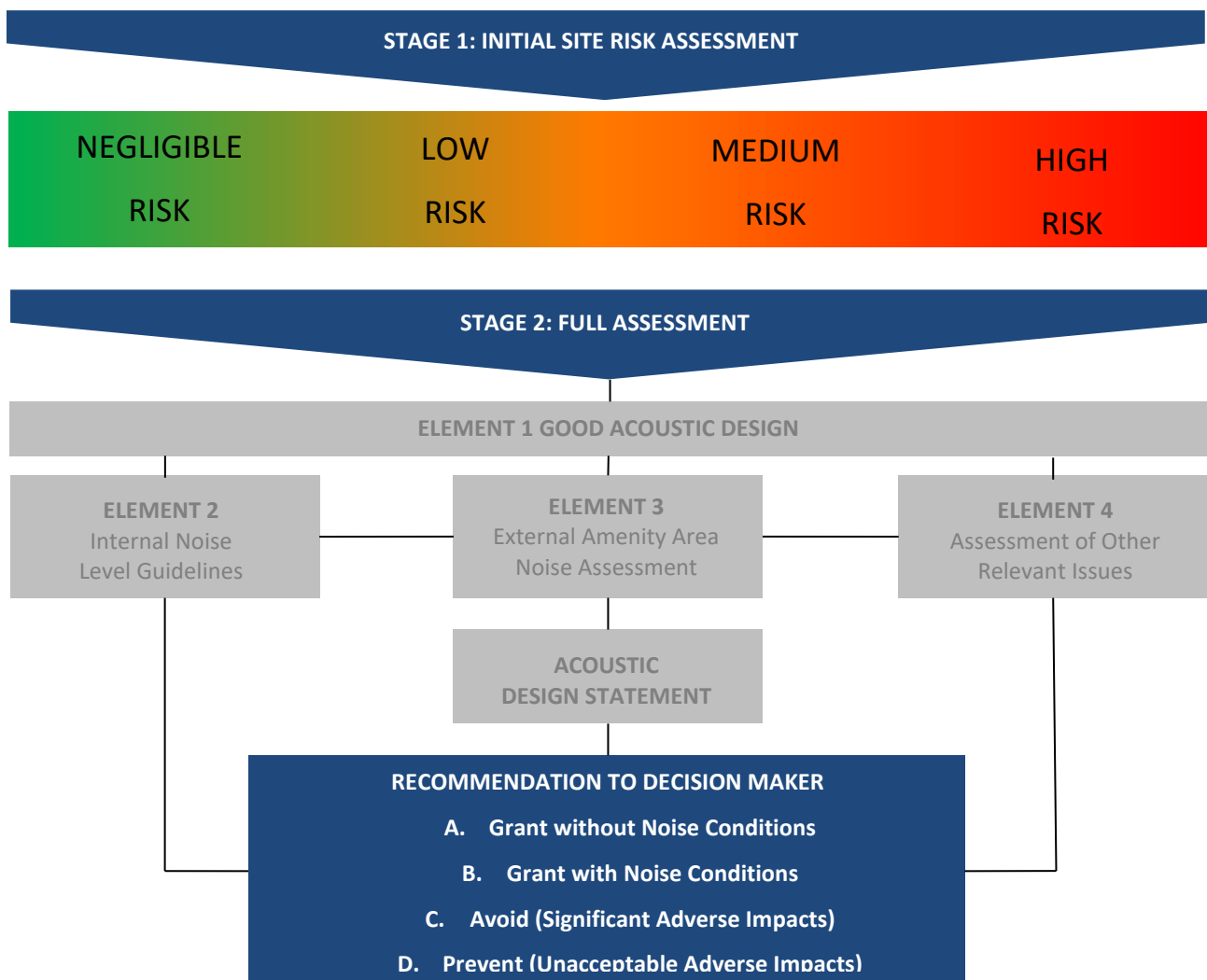
In accordance with Stage 2: Full Assessment, Other Noise Sources, detailed calculations and assessments should be carried out pertaining to these as PPG Noise does not provide advice and guidance when taking these elements into consideration.

### 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<br>$L_{Aeq,t}$ 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 2024 (NPPF) and Noise Policy Statement for England 2010 (NPSE).**

References and evaluations are to be made to the National Planning Policy Framework 2024(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’**

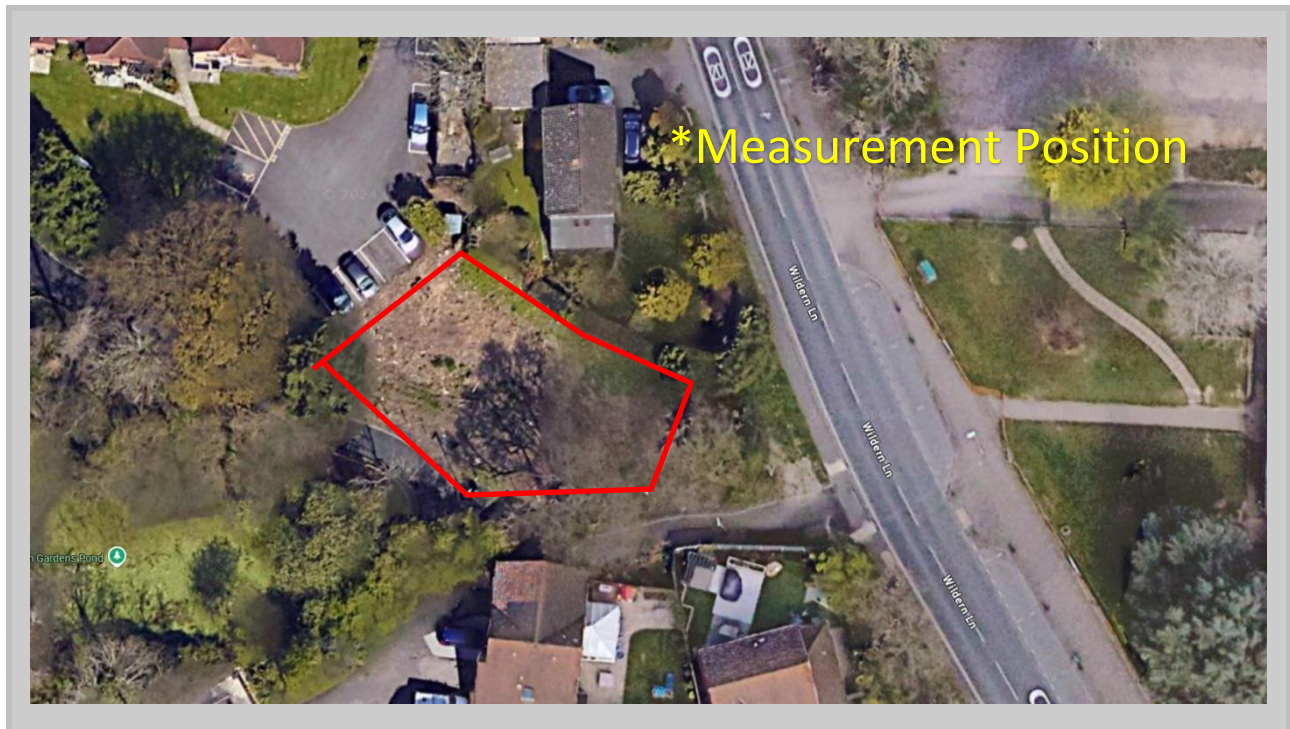
In addition, calculations are to be made for the predicted daytime noise levels within the outdoor living area and assessments made against the recommended levels within the World Health Organisation’s ‘Guidelines for Community Noise’. In order to evaluate these levels accurately, the 3D modelling software 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 Hedge End, Hampshire. The dominant noise source is road traffic noise.



### 3.1 Proposed Development

The proposed development is shown below.



#### 4 PROCEDURE

External noise levels were recorded over a typical period and analysis date extrapolated between 07:00 hrs 28<sup>th</sup> November 2024 and 07:00 hrs on 3<sup>rd</sup> December 2024 at 1 position as detailed within this report.

Position 1 was located at the rear of the site in order to capture the noise levels associated with Wildern Lane. 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.

| <u>Daytime 07:00 – 23:00</u> |                | <u>Night Time 23:00 – 07:00</u> |                    |
|------------------------------|----------------|---------------------------------|--------------------|
| LAeq 1 HOUR dB               | LA10 1 HOUR dB | LAeq 15 MINUTES dB              | LA10 15 MINUTES dB |
| LAMAX 1 HOUR dB              | LA50 1 HOUR dB | LAMAX 15 MINUTES dB             | LA50 15 MINUTES dB |
| LAMIN 1 HOUR dB              | LA90 1 HOUR dB | LAMIN 15 MINUTES dB             | LA90 15 MINUTES 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 LAeq 16 HOUR dB levels for daytime and LAeq 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 LAeq 16 Hour dB daytime and LAeq 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  $2 \times 10^{-5} \text{ Nm}^{-2}$  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

| Description                         | Make     | Type | Serial No. | Calibration Intervals | Last Calibrated | Next Due Calibration |
|-------------------------------------|----------|------|------------|-----------------------|-----------------|----------------------|
| Integrated Sound Level Meter        | Norsonic | 140  | 1403570    | 2 YEARS               | 08.08.2024      | 08.08.2026           |
| 12.5mm Microphone (with windshield) | Norsonic | 1225 | 96052      | 2 YEARS               | 08.08.2024      | 08.08.2026           |
| Microphone Pre – Amplifier          | Norsonic | 1209 | 12514      | 2 YEARS               | 08.08.2024      | 08.08.2026           |
| Calibrator                          | Norsonic | 1251 | 31310      | 1 YEAR                | 30.07.2024      | 30.07.2025           |

Full calibration certificates are available upon request.

## 6 RESULTS

### 6.1 Downloaded results, and averages.

#### 6.1.1 07:00 – 07:00 28<sup>th</sup> – 29<sup>th</sup> November 2024 – Position 1

| NOISE LEVEL SUMMARY ASSESSMENT                                                         |      |       |      | Octave Band Centre Frequency (Hz) |      |      |      |      |      |      |      |       |
|----------------------------------------------------------------------------------------|------|-------|------|-----------------------------------|------|------|------|------|------|------|------|-------|
| Date / Time                                                                            | LAeq | LAmaz | LA90 | 63                                | 125  | 250  | 500  | 1.0k | 2.0k | 4.0k | 8.0k | 16.0k |
| DAYTIME 07:00 - 23:00<br><small>LA90 1 HOUR &amp; Corresponding LAeq 1 HOUR</small>    | 66.0 | 90.6  | 56.0 | 67.4                              | 62.8 | 61.4 | 59.8 | 63.4 | 58.9 | 47.8 | 40.3 | 32.8  |
| NIGHT TIME 23:00 - 07:00<br><small>LA90 15 MIN &amp; Corresponding LAeq 15 MIN</small> | 56.0 | 82.0  | 35.0 | 55.3                              | 49.8 | 48.5 | 49.2 | 53.4 | 49.2 | 38.8 | 31.5 | 20.4  |

#### 6.1.2 07:00 – 07:00 29<sup>th</sup> – 30<sup>th</sup> November 2024 – Position 1

| NOISE LEVEL SUMMARY ASSESSMENT                                                         |      |       |      | Octave Band Centre Frequency (Hz) |      |      |      |      |      |      |      |       |
|----------------------------------------------------------------------------------------|------|-------|------|-----------------------------------|------|------|------|------|------|------|------|-------|
| Date / Time                                                                            | LAeq | LAmaz | LA90 | 63                                | 125  | 250  | 500  | 1.0k | 2.0k | 4.0k | 8.0k | 16.0k |
| DAYTIME 07:00 - 23:00<br><small>LA90 1 HOUR &amp; Corresponding LAeq 1 HOUR</small>    | 65.9 | 103.6 | 57.0 | 66.8                              | 62.1 | 61.2 | 59.9 | 63.2 | 58.8 | 47.8 | 40.9 | 32.3  |
| NIGHT TIME 23:00 - 07:00<br><small>LA90 15 MIN &amp; Corresponding LAeq 15 MIN</small> | 54.5 | 86.5  | 36.0 | 52.3                              | 52.7 | 51.5 | 48.8 | 51.2 | 47.3 | 40.9 | 38.0 | 23.3  |

#### 6.1.3 07:00 – 07:00 30<sup>th</sup> November – 1<sup>st</sup> December 2024 – Position 1

| NOISE LEVEL SUMMARY ASSESSMENT                                                         |      |       |      | Octave Band Centre Frequency (Hz) |      |      |      |      |      |      |      |       |
|----------------------------------------------------------------------------------------|------|-------|------|-----------------------------------|------|------|------|------|------|------|------|-------|
| Date / Time                                                                            | LAeq | LAmaz | LA90 | 63                                | 125  | 250  | 500  | 1.0k | 2.0k | 4.0k | 8.0k | 16.0k |
| DAYTIME 07:00 - 23:00<br><small>LA90 1 HOUR &amp; Corresponding LAeq 1 HOUR</small>    | 65.2 | 97.3  | 54.0 | 65.1                              | 60.6 | 59.7 | 58.9 | 62.6 | 58.1 | 48.7 | 42.5 | 32.1  |
| NIGHT TIME 23:00 - 07:00<br><small>LA90 15 MIN &amp; Corresponding LAeq 15 MIN</small> | 53.6 | 80.0  | 34.0 | 52.8                              | 49.3 | 46.7 | 46.3 | 50.6 | 47.2 | 40.4 | 33.7 | 24.5  |

#### 6.1.4 07:00 – 07:00 1<sup>st</sup> – 2<sup>nd</sup> December 2024 – Position 1

| NOISE LEVEL SUMMARY ASSESSMENT                                                         |      |       |      | Octave Band Centre Frequency (Hz) |      |      |      |      |      |      |      |       |
|----------------------------------------------------------------------------------------|------|-------|------|-----------------------------------|------|------|------|------|------|------|------|-------|
| Date / Time                                                                            | LAeq | LAmaz | LA90 | 63                                | 125  | 250  | 500  | 1.0k | 2.0k | 4.0k | 8.0k | 16.0k |
| DAYTIME 07:00 - 23:00<br><small>LA90 1 HOUR &amp; Corresponding LAeq 1 HOUR</small>    | 65.3 | 93.8  | 50.0 | 63.2                              | 60.1 | 58.5 | 57.6 | 61.9 | 59.3 | 53.1 | 46.0 | 36.0  |
| NIGHT TIME 23:00 - 07:00<br><small>LA90 15 MIN &amp; Corresponding LAeq 15 MIN</small> | 57.6 | 94.2  | 36.0 | 55.9                              | 52.9 | 54.5 | 54.7 | 54.0 | 49.8 | 42.0 | 36.2 | 24.1  |

#### 6.1.5 07:00 – 07:00 2<sup>nd</sup> – 3<sup>rd</sup> December 2024 – Position 1

| NOISE LEVEL SUMMARY ASSESSMENT                                                         |      |       |      | Octave Band Centre Frequency (Hz) |      |      |      |      |      |      |      |       |
|----------------------------------------------------------------------------------------|------|-------|------|-----------------------------------|------|------|------|------|------|------|------|-------|
| Date / Time                                                                            | LAeq | LAmaz | LA90 | 63                                | 125  | 250  | 500  | 1.0k | 2.0k | 4.0k | 8.0k | 16.0k |
| DAYTIME 07:00 - 23:00<br><small>LA90 1 HOUR &amp; Corresponding LAeq 1 HOUR</small>    | 66.0 | 99.2  | 58.0 | 67.0                              | 62.9 | 62.3 | 60.2 | 63.2 | 58.6 | 48.2 | 42.7 | 34.6  |
| NIGHT TIME 23:00 - 07:00<br><small>LA90 15 MIN &amp; Corresponding LAeq 15 MIN</small> | 59.2 | 98.6  | 35.0 | 57.6                              | 54.3 | 57.2 | 57.2 | 55.0 | 50.7 | 42.9 | 35.5 | 23.6  |

The following noise levels at position 1 have been used within the BS 8233: 2014 calculations

| NOISE LEVEL SUMMARY ASSESSMENT                                                        |      |      |      | Octave Band Centre Frequency (Hz) |      |      |      |      |      |      |      |       |
|---------------------------------------------------------------------------------------|------|------|------|-----------------------------------|------|------|------|------|------|------|------|-------|
| Date / Time                                                                           | LAeq | LAmx | LA90 | 63                                | 125  | 250  | 500  | 1.0k | 2.0k | 4.0k | 8.0k | 16.0k |
| DAYTIME 07:00 - 23:00<br><small>LA90 1 HOUR &amp; Corresponding LAeq 1 HOUR</small>   | 66.0 | 99.2 | 58.0 | 67.0                              | 62.9 | 62.3 | 60.2 | 63.2 | 58.6 | 48.2 | 42.7 | 34.6  |
| NIGHT TIME 23:00 - 07:00<br><small>A90 15 MIN &amp; Corresponding LAeq 15 MIN</small> | 59.2 | 98.6 | 35.0 | 57.6                              | 54.3 | 57.2 | 57.2 | 55.0 | 50.7 | 42.9 | 35.5 | 23.6  |

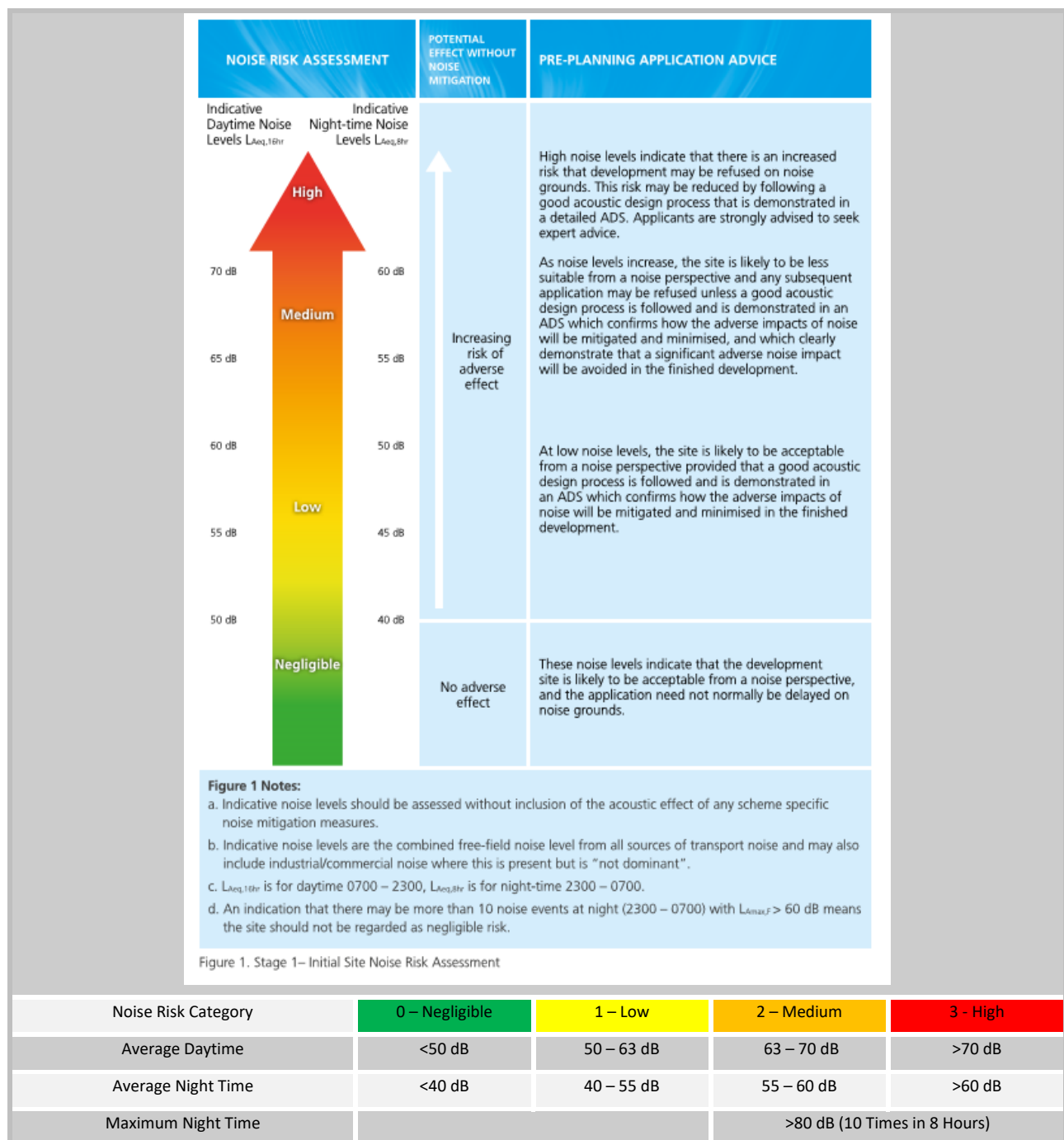
## 7 PROPG PLANNING & NOISE STAGE 1

### 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:-



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<br>1 - Low |
|-------------------------------|--------------------------------------|--------------------------------|
| Average Daytime (07:00-23:00) | $L_{Aeq, 16 \text{ HOUR}}$ 53 dB     | 50 – 63 dB                     |

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

| Time Period                      | Highest Potential Façade Noise Level    | Noise Risk Category<br>1 - Low |
|----------------------------------|-----------------------------------------|--------------------------------|
| Average Night Time (23:00-07:00) | $L_{Aeq, 16 \text{ HOUR}}$ 46 dB        | 40 – 55 dB                     |
|                                  | Maximum (10 Times) – $L_{Amax}$ 65.6 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 night time levels. Therefore, further mitigation levels will be required at Stage 2.

## **8 PROPG PLANNING & NOISE STAGE 2 - ELEMENT 1 – GOOD ACOUSTIC DESIGN**

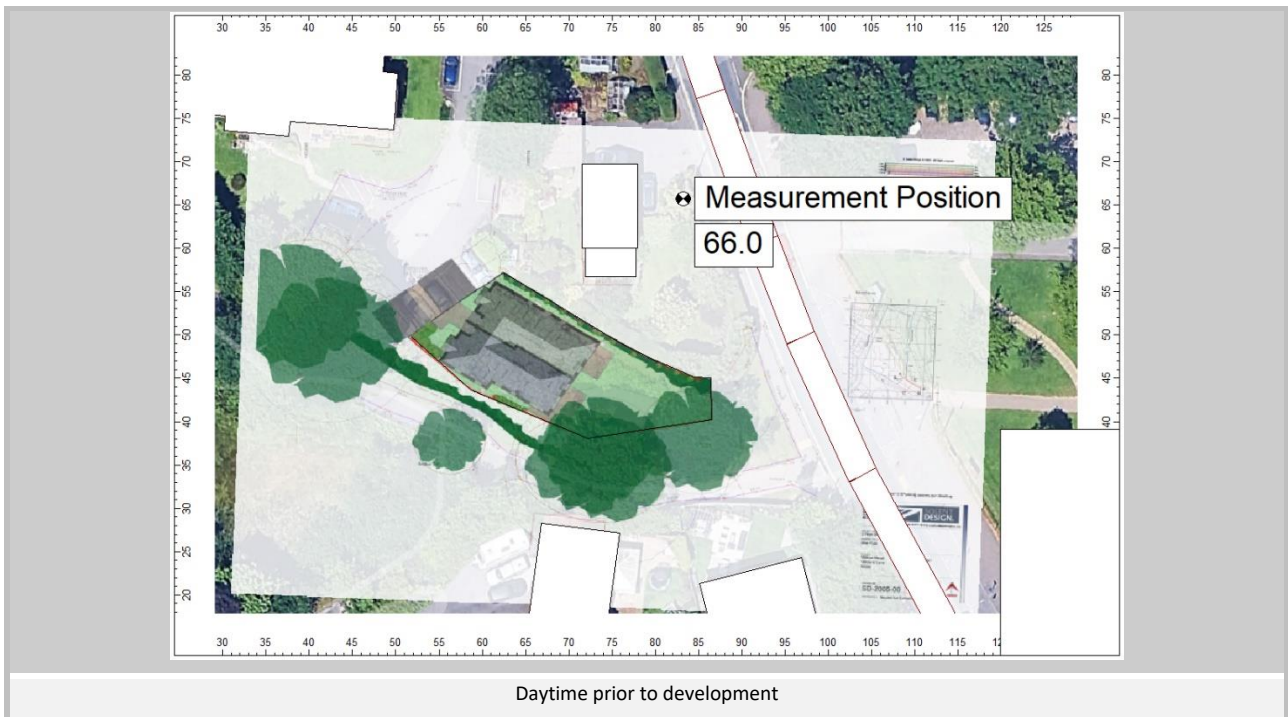
Given the size and orientation of the proposed site, it is recommended that the developer adopt, where practically possible, a good acoustic design which should include careful consideration of the positioning of the proposed properties together with thoughts being taken as to internal layouts to minimise 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

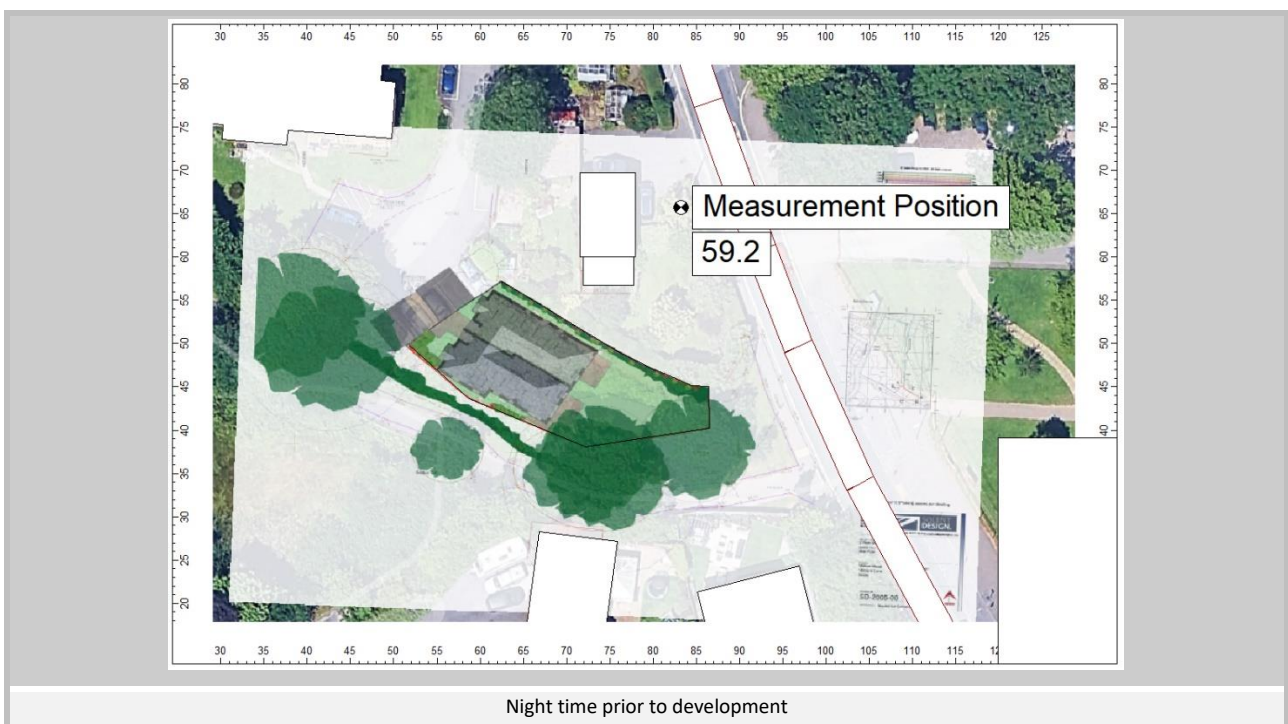
### 9.1 Discussion of Results

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.

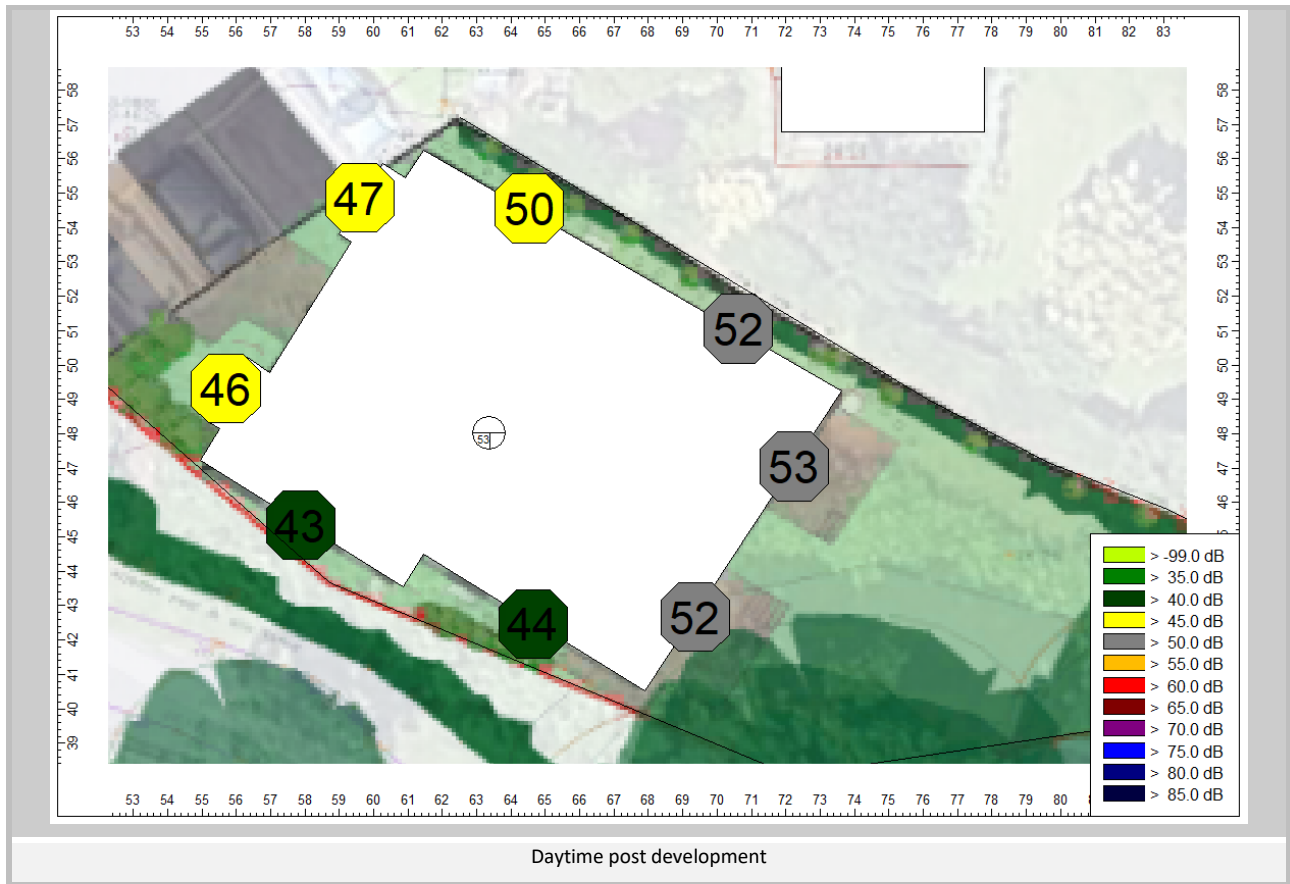
### 9.2 Existing Noise Levels – Daytime (07:00 – 23:00)



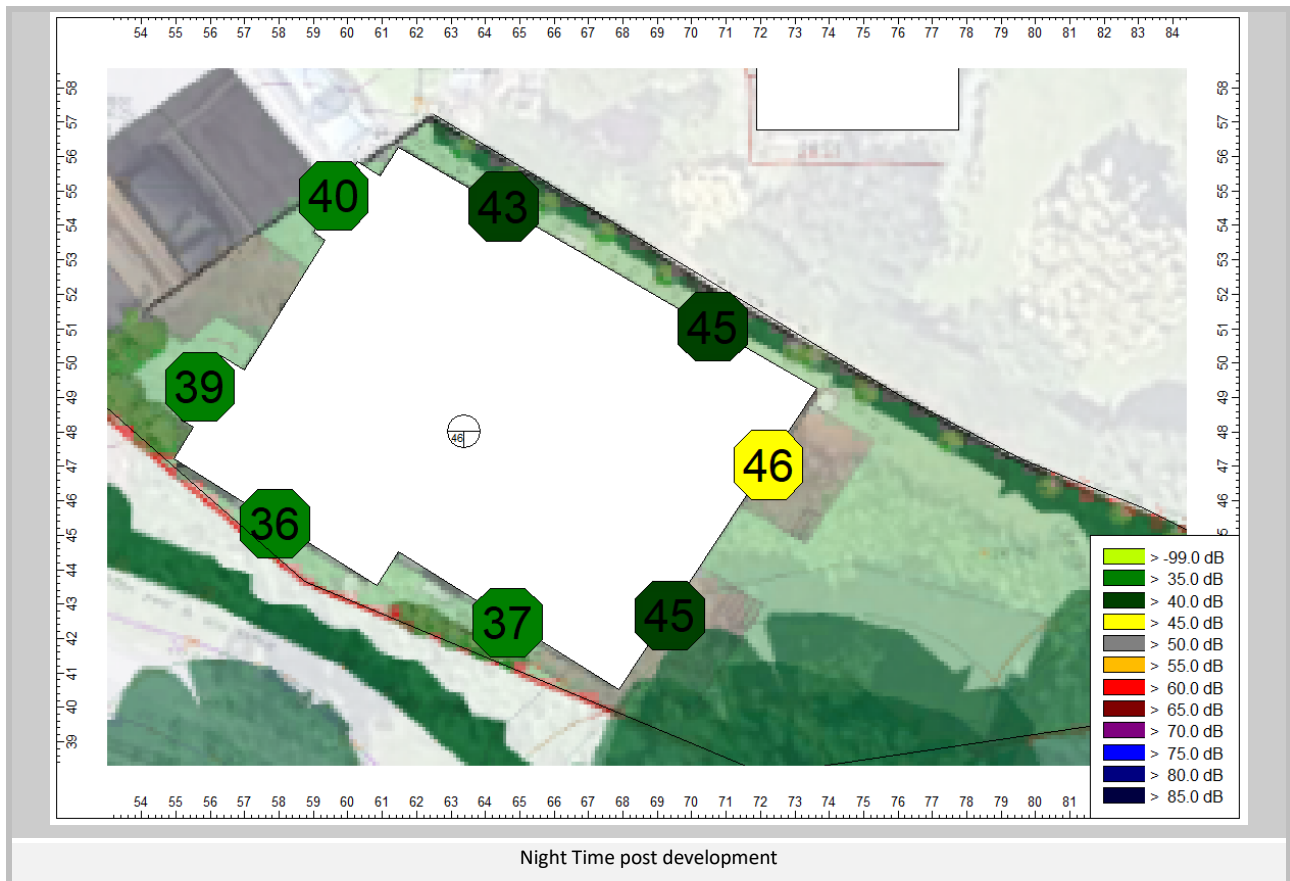
### 9.3 Existing Noise Levels – Night Time (23:00 – 07:00)



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



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



## 9.6 Recommendations

For the purpose of this assessment, the corresponding façade levels will be used within the BS 8233: 2014 calculations in order to 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 Plot 1 – Living/Kitchen – Façade Corrected to daytime 53 dB and night time 46 dB

| Recorded Site Data<br>(Corrected for Free Field) | Octave Band Centre Frequency (Hz) |      |                          |                      |              |        |
|--------------------------------------------------|-----------------------------------|------|--------------------------|----------------------|--------------|--------|
|                                                  | 125                               | 250  | 500                      | 1000                 | 2000         | 4000   |
| Daytime Leqff                                    | 49.9                              | 49.3 | 47.2                     | 50.2                 | 45.6         | 35.2   |
| Night time Leqff                                 | 41.1                              | 44.0 | 44.0                     | 41.8                 | 37.5         | 29.7   |
|                                                  |                                   |      |                          |                      |              |        |
| Room Data                                        | Sf                                | Sr   | Swi                      | Sew                  | Srr          | Volume |
| Area m²                                          | 12                                | 25   | 4                        | 8                    | 25           | 60     |
|                                                  |                                   |      |                          |                      |              |        |
| Specification Summary                            | Site Specific Specification       |      |                          | Attenuation Required |              |        |
| Glazing Specification                            | 4mm / (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             |      |                          | Rw                   | 57 dB        |        |
|                                                  |                                   |      |                          |                      |              |        |
| Calculation Results                              |                                   |      |                          |                      |              |        |
| Daytime Hours (07:00-23:00)                      |                                   |      | L <sub>Aeq</sub> 16 HOUR | 25.0                 | dB(A)        |        |
| Night Time Hours (23:00-07:00)                   |                                   |      | L <sub>Aeq</sub> 8 HOUR  | 19.1                 | dB(A)        |        |

## 9.9 Plot 1 – Bedroom 1 – Façade Corrected to daytime 47 dB and night time 40 dB

| Recorded Site Data<br>(Corrected for Free Field) | Octave Band Centre Frequency (Hz)                                                                                      |      |                          |                      |              |        |
|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------|--------------------------|----------------------|--------------|--------|
|                                                  | 125                                                                                                                    | 250  | 500                      | 1000                 | 2000         | 4000   |
| Daytime Leqff                                    | 43.9                                                                                                                   | 43.3 | 41.2                     | 44.2                 | 39.6         | 29.2   |
| Night time Leqff                                 | 35.1                                                                                                                   | 38.0 | 38.0                     | 35.8                 | 31.5         | 23.7   |
|                                                  |                                                                                                                        |      |                          |                      |              |        |
| Room Data                                        | Sf                                                                                                                     | Sr   | Swi                      | Sew                  | Srr          | Volume |
| Area m²                                          | 12                                                                                                                     | 13   | 3.5                      | 8.5                  | 13           | 31     |
|                                                  |                                                                                                                        |      |                          |                      |              |        |
| Specification Summary                            | Site Specific Specification                                                                                            |      |                          | Attenuation Required |              |        |
| Glazing Specification                            | 4mm / (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                                                                                                  |      |                          | Rw                   | 57 dB        |        |
|                                                  |                                                                                                                        |      |                          |                      |              |        |
| Calculation Results                              |                                                                                                                        |      |                          |                      |              |        |
| Daytime Hours (07:00-23:00)                      |                                                                                                                        |      | L <sub>Aeq</sub> 16 HOUR | 18.6                 | dB(A)        |        |
| Night Time Hours (23:00-07:00)                   |                                                                                                                        |      | L <sub>Aeq</sub> 8 HOUR  | 12.7                 | dB(A)        |        |
|                                                  |                                                                                                                        |      |                          |                      |              |        |
| Formula                                          | $Leq2=Leqff+10\log[A0/S*10^{(-Dne/10)}+Swi/S*10^{(-Rwi/10)}+Sew/10*10^{(-Rew/10)}+Srr/S*10^{(-Rrr/10)}]+10\log(S/A)+3$ |      |                          |                      |              |        |
| Note                                             | The expected precision of this calculation is ±2 dB.                                                                   |      |                          |                      |              |        |

**9.10 Plot 1 – Bedroom 2 – Façade Corrected to daytime 53 dB and night time 46 dB**

| Recorded Site Data<br>(Corrected for Free Field) | Octave Band Centre Frequency (Hz)                                                                                      |      |                          |                      |              |        |
|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------|--------------------------|----------------------|--------------|--------|
|                                                  | 125                                                                                                                    | 250  | 500                      | 1000                 | 2000         | 4000   |
| Daytime Leqff                                    | 49.9                                                                                                                   | 49.3 | 47.2                     | 50.2                 | 45.6         | 35.2   |
| Night time Leqff                                 | 41.1                                                                                                                   | 44.0 | 44.0                     | 41.8                 | 37.5         | 29.7   |
|                                                  |                                                                                                                        |      |                          |                      |              |        |
| Room Data                                        | Sf                                                                                                                     | Sr   | Swi                      | Sew                  | Srr          | Volume |
| Area m²                                          | 6                                                                                                                      | 10   | 1                        | 5                    | 10           | 23     |
|                                                  |                                                                                                                        |      |                          |                      |              |        |
| Specification Summary                            | Site Specific Specification                                                                                            |      |                          | Attenuation Required |              |        |
| Glazing Specification                            | 4mm / (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                                                                                                  |      |                          | Rw                   | 57 dB        |        |
|                                                  |                                                                                                                        |      |                          |                      |              |        |
| Calculation Results                              |                                                                                                                        |      |                          |                      |              |        |
| Daytime Hours (07:00-23:00)                      |                                                                                                                        |      | L <sub>Aeq</sub> 16 HOUR | 22.1                 | dB(A)        |        |
| Night Time Hours (23:00-07:00)                   |                                                                                                                        |      | L <sub>Aeq</sub> 8 HOUR  | 15.5                 | dB(A)        |        |
|                                                  |                                                                                                                        |      |                          |                      |              |        |
| Formula                                          | $Leq2=Leqff+10\log[A0/S*10^{(-Dne/10)}+Swi/S*10^{(-Rwi/10)}+Sew/10*10^{(-Rew/10)}+Srr/S*10^{(-Rrr/10)}]+10\log(S/A)+3$ |      |                          |                      |              |        |
| Note                                             | The expected precision of this calculation is ±2 dB.                                                                   |      |                          |                      |              |        |

**9.11 Plot 2 – Living/Kitchen – Façade Corrected to daytime 53 dB and night time 46 dB**

| Recorded Site Data<br>(Corrected for Free Field) | Octave Band Centre Frequency (Hz)                                                                                    |      |                          |                      |              |        |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|------|--------------------------|----------------------|--------------|--------|
|                                                  | 125                                                                                                                  | 250  | 500                      | 1000                 | 2000         | 4000   |
| Daytime Leqff                                    | 49.9                                                                                                                 | 49.3 | 47.2                     | 50.2                 | 45.6         | 35.2   |
| Night time Leqff                                 | 41.1                                                                                                                 | 44.0 | 44.0                     | 41.8                 | 37.5         | 29.7   |
|                                                  |                                                                                                                      |      |                          |                      |              |        |
| Room Data                                        | Sf                                                                                                                   | Sr   | Swi                      | Sew                  | Srr          | Volume |
| Area m²                                          | 12                                                                                                                   | 25   | 4                        | 8                    | 25           | 60     |
|                                                  |                                                                                                                      |      |                          |                      |              |        |
| Specification Summary                            | Site Specific Specification                                                                                          |      |                          | Attenuation Required |              |        |
| Glazing Specification                            | 4mm / (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                                                                                                |      |                          | Rw                   | 57 dB        |        |
|                                                  |                                                                                                                      |      |                          |                      |              |        |
| Calculation Results                              |                                                                                                                      |      |                          |                      |              |        |
| Daytime Hours (07:00-23:00)                      |                                                                                                                      |      | L <sub>Aeq</sub> 16 HOUR | 25.0                 | dB(A)        |        |
| Night Time Hours (23:00-07:00)                   |                                                                                                                      |      | L <sub>Aeq</sub> 8 HOUR  | 19.1                 | 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.                                                                 |      |                          |                      |              |        |

**9.12 Plot 2 – Bedroom 1 – Façade Corrected to daytime 47 dB and night time 40 dB**

| Recorded Site Data<br>(Corrected for Free Field) | Octave Band Centre Frequency (Hz)                                                                                      |      |                          |                      |              |        |
|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------|--------------------------|----------------------|--------------|--------|
|                                                  | 125                                                                                                                    | 250  | 500                      | 1000                 | 2000         | 4000   |
| Daytime Leqff                                    | 43.9                                                                                                                   | 43.3 | 41.2                     | 44.2                 | 39.6         | 29.2   |
| Night time Leqff                                 | 35.1                                                                                                                   | 38.0 | 38.0                     | 35.8                 | 31.5         | 23.7   |
|                                                  |                                                                                                                        |      |                          |                      |              |        |
| Room Data                                        | Sf                                                                                                                     | Sr   | Swi                      | Sew                  | Srr          | Volume |
| Area m²                                          | 13                                                                                                                     | 15   | 3.5                      | 9.5                  | 15           | 36     |
|                                                  |                                                                                                                        |      |                          |                      |              |        |
| Specification Summary                            | Site Specific Specification                                                                                            |      |                          | Attenuation Required |              |        |
| Glazing Specification                            | 4mm / (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                                                                                                  |      |                          | Rw                   | 57 dB        |        |
|                                                  |                                                                                                                        |      |                          |                      |              |        |
| Calculation Results                              |                                                                                                                        |      |                          |                      |              |        |
| Daytime Hours (07:00-23:00)                      |                                                                                                                        |      | L <sub>Aeq</sub> 16 HOUR | 18.6                 | dB(A)        |        |
| Night Time Hours (23:00-07:00)                   |                                                                                                                        |      | L <sub>Aeq</sub> 8 HOUR  | 12.7                 | dB(A)        |        |
|                                                  |                                                                                                                        |      |                          |                      |              |        |
| Formula                                          | $Leq2=Leqff+10\log[A0/S*10^{(-Dne/10)}+Swi/S*10^{(-Rwi/10)}+Sew/10*10^{(-Rew/10)}+Srr/S*10^{(-Rrr/10)}]+10\log(S/A)+3$ |      |                          |                      |              |        |
| Note                                             | The expected precision of this calculation is ±2 dB.                                                                   |      |                          |                      |              |        |

**9.13 Plot 2 – Bedroom 2 – Façade Corrected to daytime 53 dB and night time 46 dB**

| Recorded Site Data<br>(Corrected for Free Field) | Octave Band Centre Frequency (Hz)                                                                                      |      |                          |                      |              |        |
|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|------|--------------------------|----------------------|--------------|--------|
|                                                  | 125                                                                                                                    | 250  | 500                      | 1000                 | 2000         | 4000   |
| Daytime Leqff                                    | 49.9                                                                                                                   | 49.3 | 47.2                     | 50.2                 | 45.6         | 35.2   |
| Night time Leqff                                 | 41.1                                                                                                                   | 44.0 | 44.0                     | 41.8                 | 37.5         | 29.7   |
|                                                  |                                                                                                                        |      |                          |                      |              |        |
| Room Data                                        | Sf                                                                                                                     | Sr   | Swi                      | Sew                  | Srr          | Volume |
| Area m²                                          | 6                                                                                                                      | 8    | 1                        | 5                    | 8            | 19     |
|                                                  |                                                                                                                        |      |                          |                      |              |        |
| Specification Summary                            | Site Specific Specification                                                                                            |      |                          | Attenuation Required |              |        |
| Glazing Specification                            | 4mm / (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                                                                                                  |      |                          | Rw                   | 57 dB        |        |
|                                                  |                                                                                                                        |      |                          |                      |              |        |
| Calculation Results                              |                                                                                                                        |      |                          |                      |              |        |
| Daytime Hours (07:00-23:00)                      |                                                                                                                        |      | L <sub>Aeq</sub> 16 HOUR | 22.1                 | dB(A)        |        |
| Night Time Hours (23:00-07:00)                   |                                                                                                                        |      | L <sub>Aeq</sub> 8 HOUR  | 15.5                 | dB(A)        |        |
|                                                  |                                                                                                                        |      |                          |                      |              |        |
| Formula                                          | $Leq2=Leqff+10\log[A0/S*10^{(-Dne/10)}+Swi/S*10^{(-Rwi/10)}+Sew/10*10^{(-Rew/10)}+Srr/S*10^{(-Rrr/10)}]+10\log(S/A)+3$ |      |                          |                      |              |        |
| Note                                             | The expected precision of this calculation is ±2 dB.                                                                   |      |                          |                      |              |        |

#### 9.14 Glazing ( $R_{wi}$ )

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

#### 9.15 Ventilation ( $R_{wi}$ )

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

#### 9.16 Walls (Non-Glazed Elements) ( $R_{ew}$ )

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

#### 9.17 Roof ( $R_{rr}$ )

| Octave Band Frequency | 125  | 250  | 500  | 1000 | 2000 | 4000 | $R_w$ dB |
|-----------------------|------|------|------|------|------|------|----------|
| Minimum Value         | 39.0 | 48.0 | 55.0 | 60.0 | 59.0 | 61.0 | 57       |

#### **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.

#### 9.18 Glazing & Ventilation Assessment

The development should be designed with a 4mm glass / 16mm air gap / 6mm 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.

## **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’:-

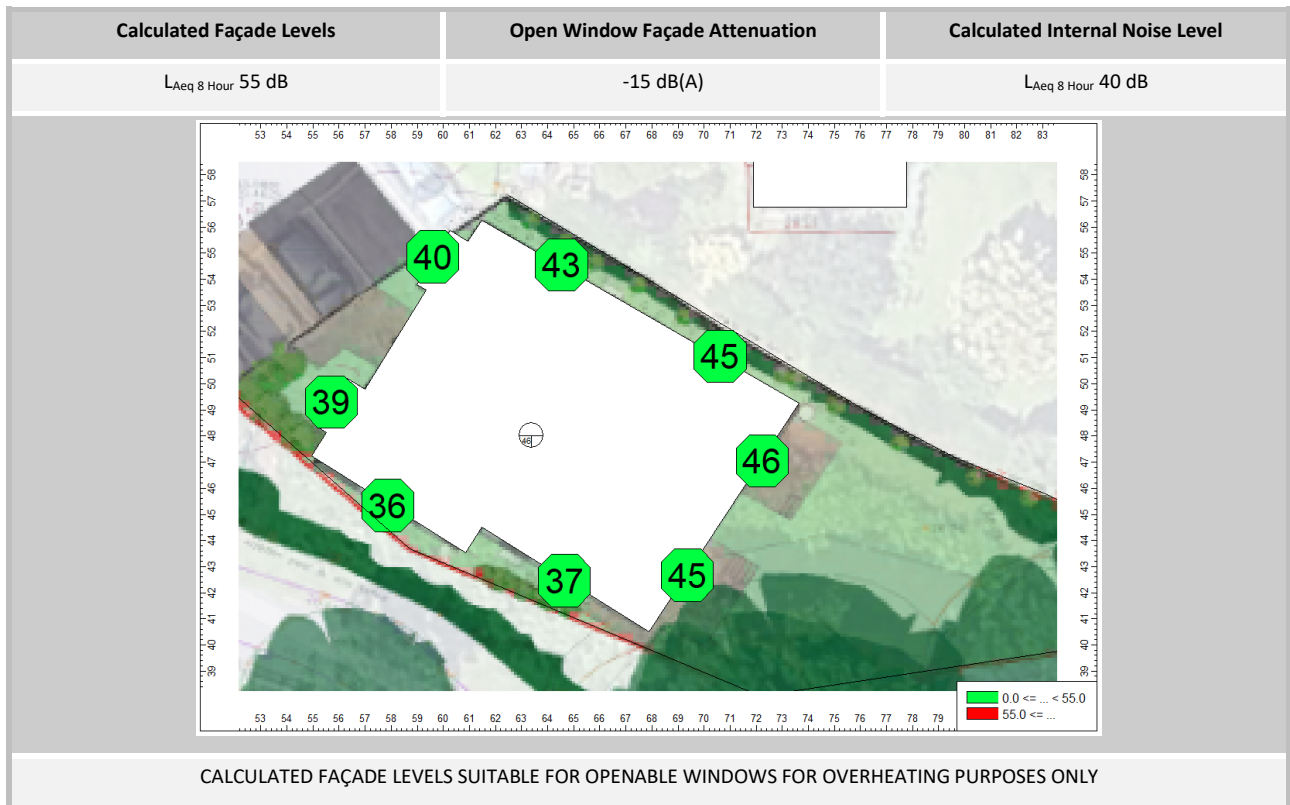
- 3.2 In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (11pm to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

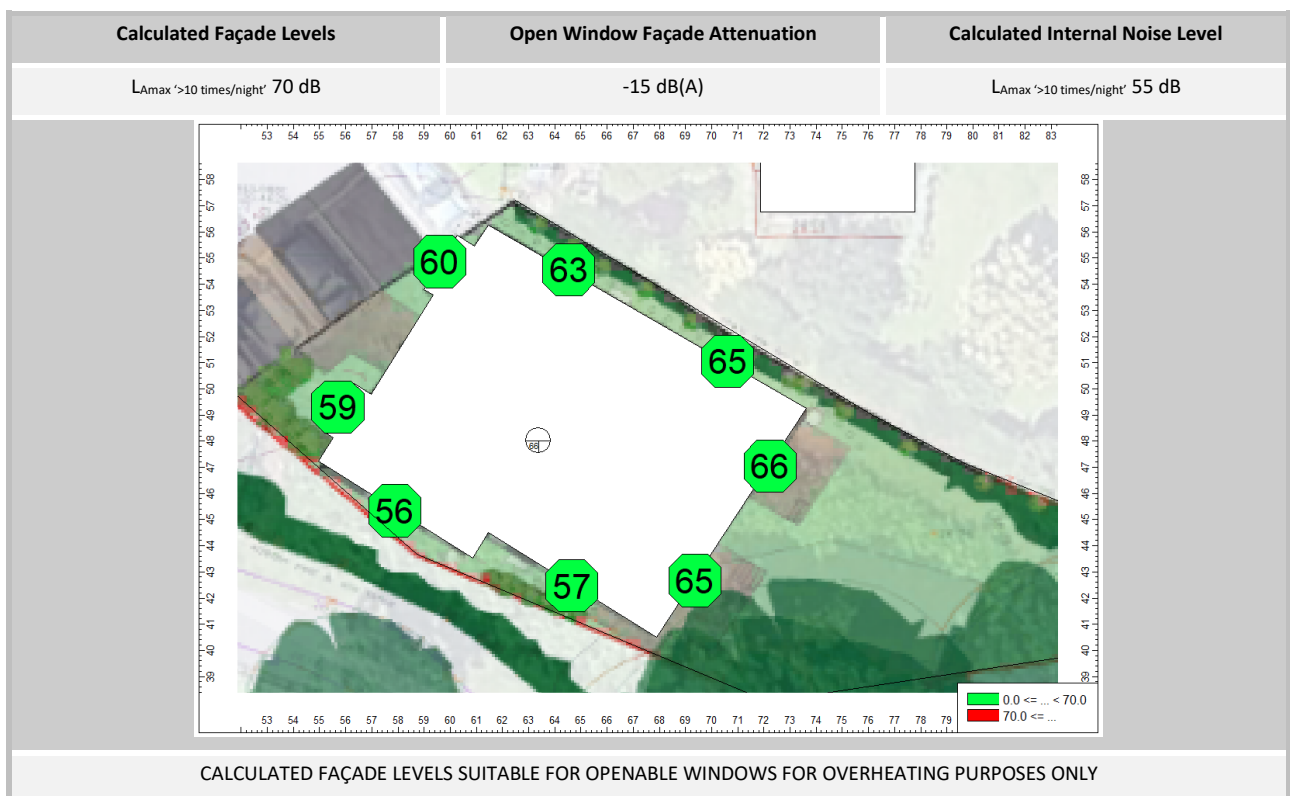
## 10.2 Assessment of Openable Windows

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



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



### 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  $L_{Aeq\ 16\text{ HOUR}}$  35 dB and Night Time  $L_{Aeq\ 8\text{ HOUR}}$  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.

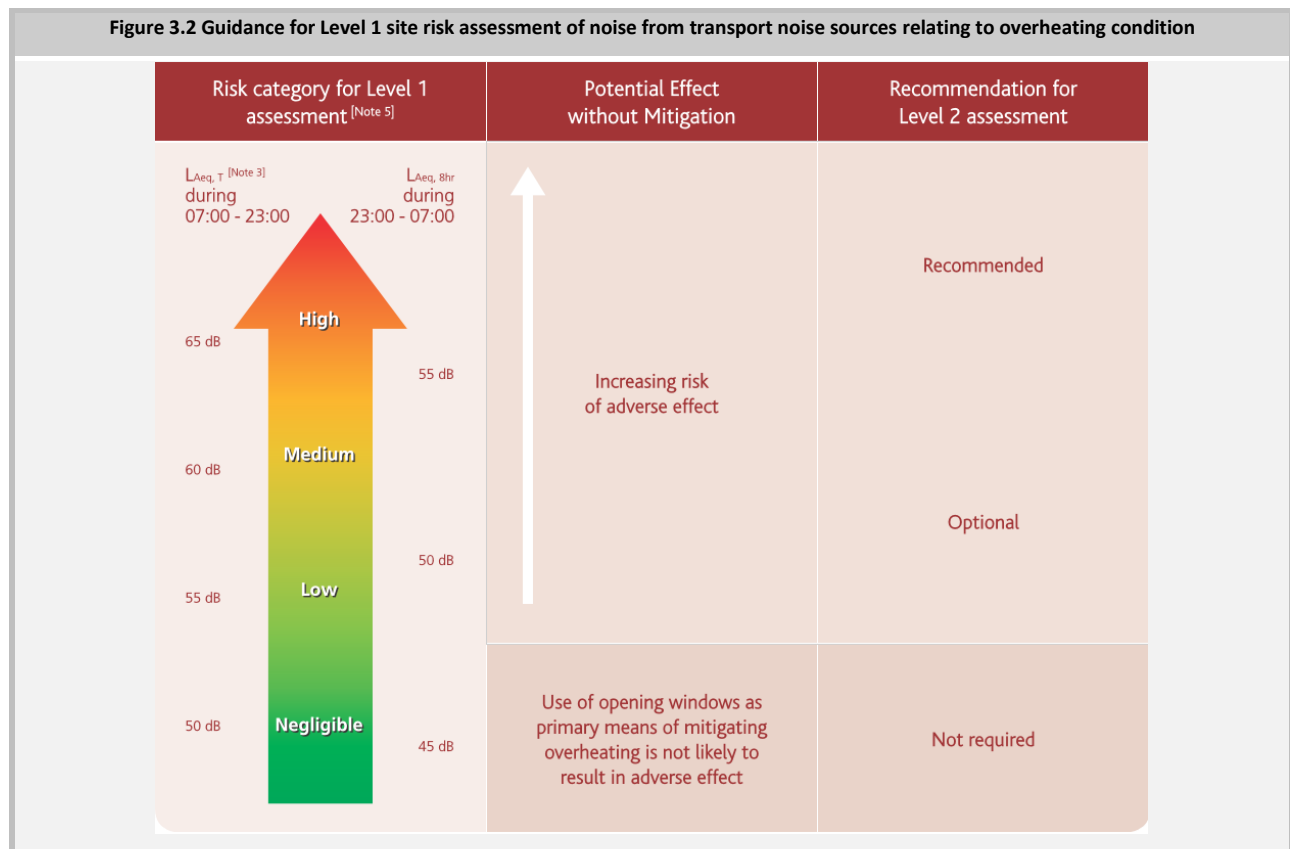
References and assessments are to be made to the Association of Noise Consultants ‘Acoustic Ventilation & Overheating – Residential Design Guide’ 2020. The calculations carried out within this report have identified an acoustic requirement for System 1 & 2 and therefore guidelines values from Table 4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

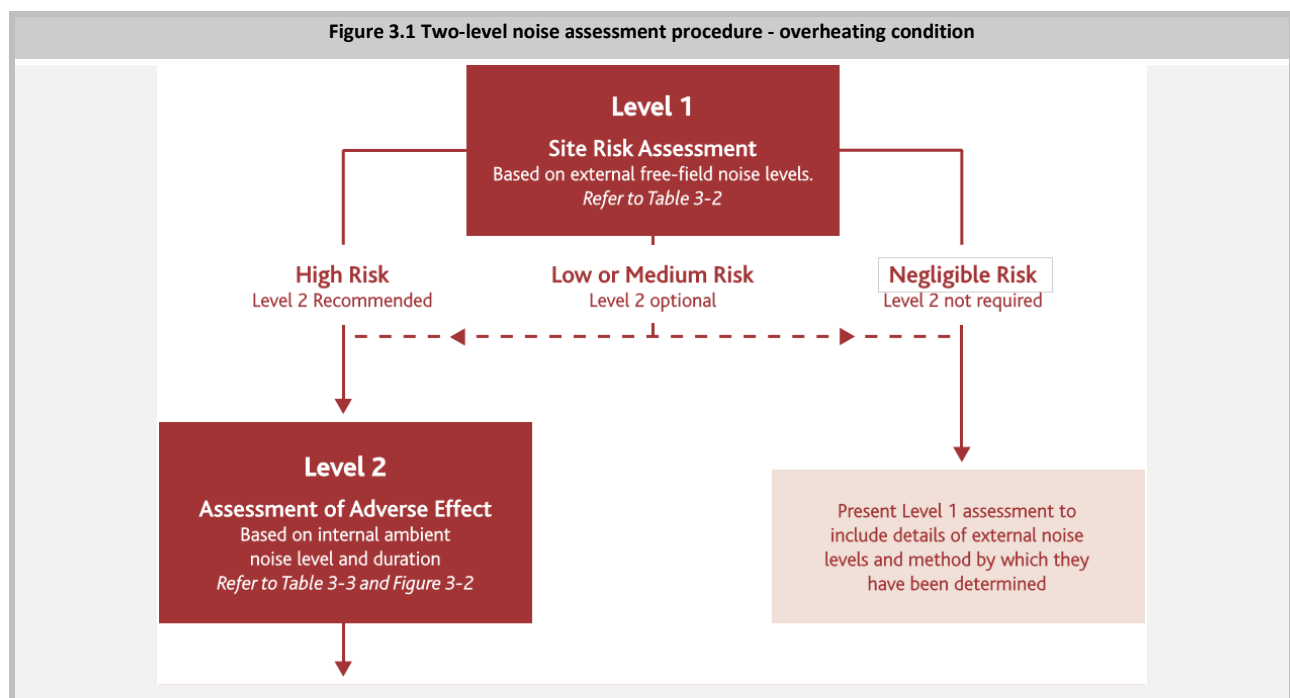
#### 10.3.1 Table 3.1 - Indoor Ambient Noise Levels Resulting from Transport Noise Sources

| 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 <sup>[Note 2]</sup> . | Guideline values from Table 4 of BS 8233:2014.                                                                                          |
|                                                                                                            | System 3: Continuous mechanical extract with background (‘trickle’) ventilators open <sup>[Note 2]</sup> .                                                                                                                                          |                                                                                                                                         |
|                                                                                                            | System 4: Continuous mechanical supply and extract with heat recovery (MVHR) – no trickle vents required.                                                                                                                                           |                                                                                                                                         |
| Part F – Purge Ventilation <sup>[Note 1]</sup>                                                             | 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



10.3.3 Figure 3.1 Two-Level Noise Assessment Procedure



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 L<sub>Amax</sub> 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  $\leq 20$ ); 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  $L_{A_{Fmax}}$  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 11<sup>th</sup> highest recorded  $L_{A_{Fmax}}$  dB level.

| $L_{A_{Fmax}}$ dB Noise Levels >80 dB |       |       |       |       |       | $L_{A_{Fmax}}$ dB Noise Levels >85 dB |       |       |       |       |       |
|---------------------------------------|-------|-------|-------|-------|-------|---------------------------------------|-------|-------|-------|-------|-------|
| $L_{A_{Fmax}}$ dB                     | 82.0  | 86.5  | 80.0  | 94.2  | 98.6  | $L_{A_{Fmax}}$ dB                     | 82.0  | 86.5  | 80.0  | 94.2  | 98.6  |
| Time                                  | Fig 1 | Fig 2 | Fig 3 | Fig 4 | Fig 5 | Time                                  | Fig 1 | Fig 2 | Fig 3 | Fig 4 | Fig 5 |
|                                       | 3     | 3     | 0     | 7     | 7     |                                       | 0     | 1     | 0     | 1     | 3     |

### 11.1.4 $L_{A_{Fmax}}$ dB Noise Levels – Night Time 23:00 – 07:00 (1 Minute Data)

| 1 Minute Event No. | Recorded $L_{A_{Fmax}}$ dB Noise Levels | Façade Corrected $L_{A_{Fmax}}$ dB Noise Levels |
|--------------------|-----------------------------------------|-------------------------------------------------|
| 1                  | 98.6                                    | 85.4                                            |
| 2                  | 92.4                                    | 79.2                                            |
| 3                  | 85.2                                    | 72.0                                            |
| 4                  | 82.2                                    | 69.0                                            |
| 5                  | 80.8                                    | 67.6                                            |
| 6                  | 80.3                                    | 67.1                                            |
| 7                  | 80.1                                    | 66.9                                            |
| 8                  | 79.9                                    | 66.7                                            |
| 9                  | 79.7                                    | 66.5                                            |
| 10                 | 79.2                                    | 66.0                                            |
| 11                 | 78.8                                    | 65.6                                            |

The following table demonstrate the results and the evaluated 11<sup>th</sup> highest  $L_{A_{max}}$  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           | 59.2                     | Recorded Noise Level at the Monitoring Position                                                                                                                                             |
| 2    | Calculated Highest Façade Level         | 46.0                     | Highest recorded façade level of the proposed development closest to the above associated monitoring position.                                                                              |
| 3    | Façade Correction                       | -13.2                    | Difference between Recorded and Calculated (Item 1 and 2)                                                                                                                                   |
| 4    | Calculated Façade Attenuation           | -30.5                    | 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    | $L_{A_{max}}$ 45 dB Criteria            | 45.0                     | $L_{A_{max}}$ 45 dB Criteria taken from WHO Guidelines. BS 8233 does not reference $L_{A_{max}}$ dB noise level criteria.                                                                   |
| 6    | Calculated Façade Level Outside         | 75.5                     | Addition of Items 4 and 5 to give a resultant target level for the 11 <sup>th</sup> Recorded $L_{A_{max}}$                                                                                  |
| 7    | 11 <sup>th</sup> Recorded $L_{A_{max}}$ | 65.6                     | 11 <sup>th</sup> Recorded $L_{A_{max}}$                                                                                                                                                     |
| 8    | $L_{A_{max}}$ 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  $L_{A_{max}}$  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 <sub>Aeq</sub> 16 HOUR 55 dB |
| Moderate Annoyance, daytime and evening | L <sub>Aeq</sub> 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.



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.



The guideline has been considered acceptable criteria for this assessment given the sites geographical location and proximity to a major road. 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 below the upper guideline of 55 dB.

## **13 ELEMENT 4 – ASSESSMENT OF OTHER RELEVANT ISSUES**

### **13.1 NPPF & NPSE**

The National Planning Policy Framework 2024 (NPPF) and assessments to the Noise Policy Statement for England 2010 (NPSE) should be made in conjunction with each other. Paragraphs 198 - 201 of the National Planning Policy Framework 2023 (NPPF) states the following:

**Paragraph 198** 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 199** 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 200** 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 201** 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.                                                                                                                                                                                                                                                                                                      |
| L <sub>Amax</sub> dB Noise Levels | Assessments and calculations demonstrate that the L <sub>Amax</sub> dB Levels are within 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 road. 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 below 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.                                                                                                                                |
| <b>OVERALL OUTCOME</b>            | <b>NOEL – No Observed Effect Level</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## 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 2024 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 2024, 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 120 hour background noise survey was undertaken from 28<sup>th</sup> November to 3<sup>rd</sup> December 2024 at one position 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          | 28/11/2024 | 03/12/2024  | 66.0         | 59.2            |

### 16.2 Potential Façade Noise Levels

#### 16.2.1 Daytime (07:00-23:00)

| Time Period                   | Highest Potential Façade Noise Level | Noise Risk Category<br>1 - Low |
|-------------------------------|--------------------------------------|--------------------------------|
| Average Daytime (07:00-23:00) | L <sub>Aeq, 16 HOUR</sub> 53 dB      | 50 – 63 dB                     |

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

| Time Period                      | Highest Potential Façade Noise Level           | Noise Risk Category<br>1 - Low |
|----------------------------------|------------------------------------------------|--------------------------------|
| Average Night Time (23:00-07:00) | L <sub>Aeq, 16 HOUR</sub> 46 dB                | 40 – 55 dB                     |
|                                  | Maximum (10 Times) – L <sub>Amax</sub> 65.6 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 night time levels. Therefore, further mitigation levels will be required at Stage 2.

### 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.

#### **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. The calculation demonstrates the external living spaces are likely to see noise levels below the upper guideline of 55 dB.

#### **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 2024 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 2024, NPPF & NPSE and that, with regards to sound, planning permission can be granted.

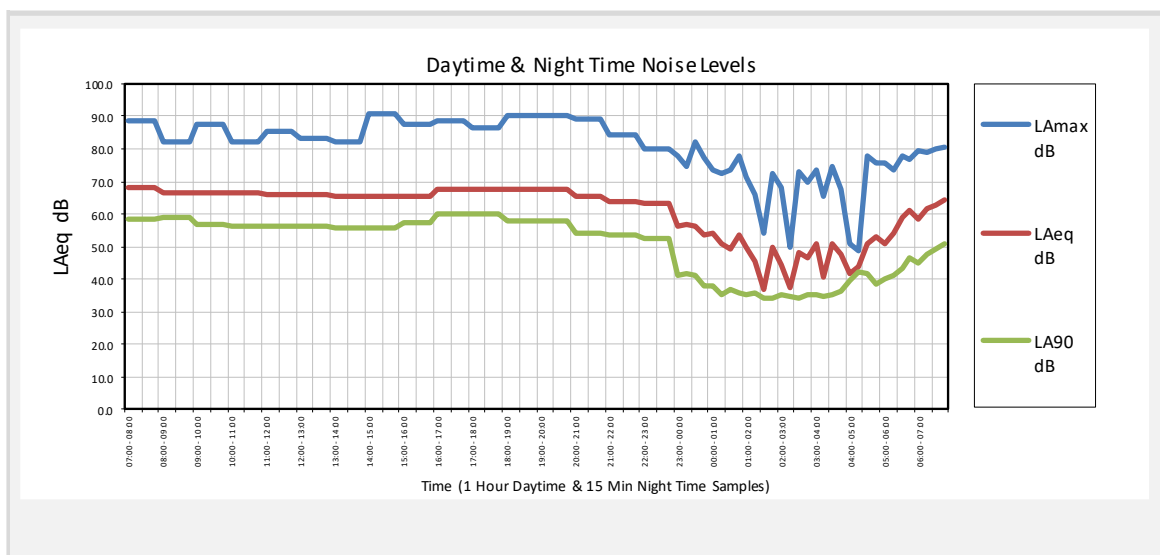
## 17 APPENDIX A - RESULTS

### 17.1 28<sup>th</sup> – 29<sup>th</sup> November 2024

| NOISE LEVEL SUMMARY ASSESSMENT                                                            |      |       |      | Octave Band Centre Frequency (Hz) |      |      |      |      |      |      |      |       |
|-------------------------------------------------------------------------------------------|------|-------|------|-----------------------------------|------|------|------|------|------|------|------|-------|
| Date / Time                                                                               | LAeq | LAmaz | LA90 | 63                                | 125  | 250  | 500  | 1.0k | 2.0k | 4.0k | 8.0k | 16.0k |
| DAYTIME 07:00 - 23:00<br><small>LAeq 16 HOUR &amp; Cor r esponding LAmaz 16 HOUR</small>  | 66.0 | 90.6  | 56.0 | 67.4                              | 62.8 | 61.4 | 59.8 | 63.4 | 58.9 | 47.8 | 40.3 | 32.8  |
| NIGHT TIME 23:00 - 07:00<br><small>LAeq 8 HOUR &amp; Cor r esponding LAmaz 8 HOUR</small> | 56.0 | 82.0  | 35.0 | 55.3                              | 49.8 | 48.5 | 49.2 | 53.4 | 49.2 | 38.8 | 31.5 | 20.4  |

| DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES |      |       |      | Octave Band Centre Frequency (Hz) |      |      |      |       |       |       |       |        |
|---------------------------------------------------|------|-------|------|-----------------------------------|------|------|------|-------|-------|-------|-------|--------|
| Date / Time                                       | LAeq | LAmaz | LA90 | 63                                | 125  | 250  | 500  | 1.0 k | 2.0 k | 4.0 k | 8.0 k | 16.0 k |
| 07:00 - 08:00                                     | 68.0 | 67.2  | 58.2 | 69.7                              | 64.1 | 63.2 | 616  | 65.5  | 60.7  | 50.6  | 43.0  | 32.3   |
| 08:00 - 09:00                                     | 66.3 | 82.0  | 59.1 | 69.4                              | 63.7 | 60.6 | 59.8 | 63.7  | 59.3  | 49.3  | 43.9  | 35.2   |
| 09:00 - 10:00                                     | 66.8 | 87.8  | 56.9 | 67.4                              | 61.0 | 59.4 | 59.6 | 64.3  | 60.0  | 49.9  | 43.1  | 31.5   |
| 10:00 - 11:00                                     | 66.3 | 82.4  | 56.0 | 67.8                              | 63.0 | 60.2 | 59.8 | 63.8  | 59.4  | 48.5  | 42.1  | 29.5   |
| 11:00 - 12:00                                     | 66.0 | 85.3  | 56.5 | 65.9                              | 61.1 | 60.4 | 59.2 | 63.6  | 59.0  | 46.9  | 37.4  | 29.9   |
| 12:00 - 13:00                                     | 65.8 | 83.3  | 56.2 | 67.5                              | 60.7 | 59.3 | 58.8 | 63.4  | 58.9  | 47.6  | 38.6  | 26.4   |
| 13:00 - 14:00                                     | 65.4 | 82.3  | 55.9 | 65.3                              | 61.2 | 58.7 | 58.4 | 63.1  | 58.4  | 46.3  | 37.3  | 32.6   |
| 14:00 - 15:00                                     | 65.6 | 90.6  | 55.5 | 67.7                              | 65.4 | 63.0 | 59.8 | 62.8  | 58.2  | 46.8  | 38.3  | 37.6   |
| 15:00 - 16:00                                     | 65.6 | 87.7  | 57.6 | 68.2                              | 62.9 | 59.5 | 59.1 | 63.0  | 58.5  | 47.7  | 38.9  | 39.0   |
| 16:00 - 17:00                                     | 67.4 | 88.8  | 59.8 | 68.7                              | 65.7 | 64.5 | 612  | 64.6  | 60.2  | 49.0  | 41.1  | 32.4   |
| 17:00 - 18:00                                     | 67.4 | 86.6  | 59.9 | 68.6                              | 64.4 | 62.3 | 60.7 | 64.8  | 60.4  | 48.8  | 41.0  | 31.5   |
| 18:00 - 19:00                                     | 67.6 | 90.2  | 58.1 | 68.2                              | 63.3 | 65.5 | 63.3 | 64.4  | 60.0  | 48.3  | 41.0  | 31.3   |
| 19:00 - 20:00                                     | 65.3 | 89.0  | 54.2 | 67.0                              | 61.8 | 61.0 | 59.1 | 62.6  | 58.2  | 46.5  | 38.8  | 28.4   |
| 20:00 - 21:00                                     | 64.0 | 84.1  | 53.5 | 63.3                              | 57.9 | 56.2 | 56.7 | 61.7  | 57.3  | 45.3  | 37.1  | 26.5   |
| 21:00 - 22:00                                     | 63.2 | 79.9  | 52.7 | 65.5                              | 59.1 | 55.8 | 55.8 | 60.8  | 56.5  | 44.6  | 36.4  | 25.9   |
| 22:00 - 23:00                                     | 61.0 | 90.3  | 46.5 | 61.5                              | 62.4 | 61.6 | 56.9 | 57.2  | 52.7  | 40.7  | 31.5  | 21.4   |

| NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES |      |       |      | Octave Band Centre Frequency (Hz) |      |      |      |       |       |       |       |        |
|---------------------------------------------------------|------|-------|------|-----------------------------------|------|------|------|-------|-------|-------|-------|--------|
| Date / Time                                             | LAeq | LAmaz | LA90 | 63                                | 125  | 250  | 500  | 1.0 k | 2.0 k | 4.0 k | 8.0 k | 16.0 k |
| 23:00 - 23:15                                           | 56.0 | 77.8  | 41.2 | 54.9                              | 52.3 | 48.5 | 48.0 | 53.2  | 50.1  | 37.8  | 28.9  | 18.7   |
| 23:15 - 23:30                                           | 57.0 | 74.7  | 41.6 | 51.1                              | 47.9 | 48.5 | 49.3 | 54.9  | 49.9  | 37.3  | 28.5  | 18.7   |
| 23:30 - 23:45                                           | 56.1 | 82.0  | 41.3 | 52.4                              | 48.8 | 46.8 | 47.8 | 53.4  | 50.4  | 37.1  | 25.6  | 14.3   |
| 23:45 - 00:00                                           | 53.6 | 77.1  | 38.1 | 57.3                              | 51.0 | 46.2 | 46.7 | 51.5  | 46.0  | 34.3  | 27.4  | 17.5   |
| 00:00 - 00:15                                           | 53.9 | 73.7  | 38.0 | 53.7                              | 46.9 | 46.2 | 46.3 | 51.6  | 47.0  | 34.8  | 25.7  | 15.0   |
| 00:15 - 00:30                                           | 50.6 | 72.3  | 35.5 | 47.5                              | 42.3 | 43.6 | 43.3 | 48.4  | 43.8  | 31.9  | 23.5  | 14.4   |
| 00:30 - 00:45                                           | 49.1 | 73.3  | 36.7 | 51.4                              | 42.4 | 40.8 | 43.4 | 46.7  | 41.6  | 31.5  | 24.9  | 15.3   |
| 00:45 - 01:00                                           | 53.3 | 77.6  | 35.9 | 54.3                              | 46.4 | 43.8 | 47.1 | 50.4  | 47.1  | 37.6  | 30.2  | 19.7   |
| 01:00 - 01:15                                           | 49.6 | 71.4  | 35.3 | 49.7                              | 44.5 | 43.8 | 44.5 | 47.1  | 42.1  | 30.8  | 22.3  | 12.3   |
| 01:15 - 01:30                                           | 45.5 | 65.8  | 35.7 | 49.2                              | 42.8 | 40.2 | 39.8 | 42.1  | 39.0  | 32.1  | 25.0  | 14.1   |
| 01:30 - 01:45                                           | 37.0 | 54.1  | 34.4 | 45.6                              | 38.1 | 34.4 | 33.2 | 34.4  | 26.2  | 19.7  | 16.5  | 10.4   |
| 01:45 - 02:00                                           | 49.8 | 72.2  | 34.2 | 50.3                              | 45.1 | 43.5 | 43.6 | 47.4  | 42.4  | 30.4  | 21.6  | 12.7   |
| 02:00 - 02:15                                           | 44.7 | 68.1  | 35.0 | 47.6                              | 41.7 | 38.7 | 38.6 | 42.8  | 35.5  | 22.7  | 15.2  | 10.1   |
| 02:15 - 02:30                                           | 37.4 | 49.6  | 34.9 | 46.8                              | 38.1 | 35.0 | 35.4 | 34.4  | 24.8  | 16.6  | 14.0  | 9.7    |
| 02:30 - 02:45                                           | 48.3 | 72.8  | 34.2 | 47.7                              | 40.8 | 40.7 | 40.7 | 46.1  | 41.0  | 28.0  | 18.2  | 10.5   |
| 02:45 - 03:00                                           | 46.8 | 70.0  | 35.0 | 49.0                              | 41.4 | 39.5 | 39.4 | 45.3  | 37.8  | 25.6  | 17.8  | 10.4   |
| 03:00 - 03:15                                           | 50.8 | 73.6  | 35.0 | 47.9                              | 42.3 | 41.9 | 42.7 | 48.4  | 44.4  | 31.4  | 20.4  | 11.2   |
| 03:15 - 03:30                                           | 40.8 | 65.4  | 34.8 | 46.3                              | 38.6 | 35.7 | 35.2 | 38.0  | 34.0  | 21.0  | 16.5  | 10.2   |
| 03:30 - 03:45                                           | 50.6 | 74.8  | 35.1 | 52.8                              | 51.3 | 46.3 | 46.1 | 47.2  | 42.9  | 35.8  | 27.5  | 16.7   |
| 03:45 - 04:00                                           | 47.5 | 67.8  | 36.3 | 50.5                              | 42.9 | 42.6 | 40.9 | 45.0  | 40.3  | 29.1  | 21.4  | 12.3   |
| 04:00 - 04:15                                           | 41.7 | 50.6  | 39.4 | 48.0                              | 39.2 | 36.2 | 35.0 | 34.8  | 38.0  | 28.6  | 16.3  | 10.1   |
| 04:15 - 04:30                                           | 43.6 | 48.7  | 42.3 | 47.0                              | 38.3 | 35.9 | 35.2 | 34.3  | 40.8  | 31.6  | 14.9  | 9.8    |
| 04:30 - 04:45                                           | 51.1 | 77.7  | 41.6 | 54.5                              | 45.7 | 46.2 | 46.2 | 46.1  | 46.1  | 37.0  | 26.1  | 16.4   |
| 04:45 - 05:00                                           | 53.2 | 75.7  | 38.2 | 51.7                              | 43.3 | 43.8 | 45.1 | 51.1  | 46.2  | 34.5  | 26.9  | 16.8   |
| 05:00 - 05:15                                           | 51.1 | 75.7  | 39.8 | 50.9                              | 44.3 | 43.4 | 43.9 | 48.1  | 45.1  | 35.2  | 25.7  | 14.7   |
| 05:15 - 05:30                                           | 54.1 | 73.7  | 41.1 | 56.0                              | 49.7 | 47.5 | 47.5 | 51.4  | 47.3  | 36.9  | 30.4  | 18.4   |
| 05:30 - 05:45                                           | 58.9 | 78.0  | 43.5 | 57.8                              | 55.4 | 51.4 | 51.5 | 56.5  | 52.2  | 42.1  | 35.4  | 23.8   |
| 05:45 - 06:00                                           | 61.0 | 76.6  | 46.8 | 58.2                              | 52.2 | 52.4 | 53.8 | 58.9  | 54.0  | 41.5  | 33.1  | 21.9   |
| 06:00 - 06:15                                           | 58.6 | 79.4  | 45.0 | 58.7                              | 55.7 | 54.8 | 54.5 | 55.3  | 50.9  | 42.8  | 34.7  | 24.4   |
| 06:15 - 06:30                                           | 61.5 | 79.1  | 47.6 | 58.4                              | 52.6 | 53.0 | 54.1 | 58.9  | 55.2  | 43.5  | 35.9  | 24.7   |
| 06:30 - 06:45                                           | 62.8 | 80.1  | 49.3 | 63.4                              | 55.9 | 55.3 | 56.3 | 60.2  | 55.8  | 47.2  | 41.0  | 29.1   |
| 06:45 - 07:00                                           | 64.6 | 80.7  | 51.0 | 63.0                              | 57.2 | 56.8 | 57.8 | 62.1  | 57.7  | 47.7  | 40.7  | 29.7   |

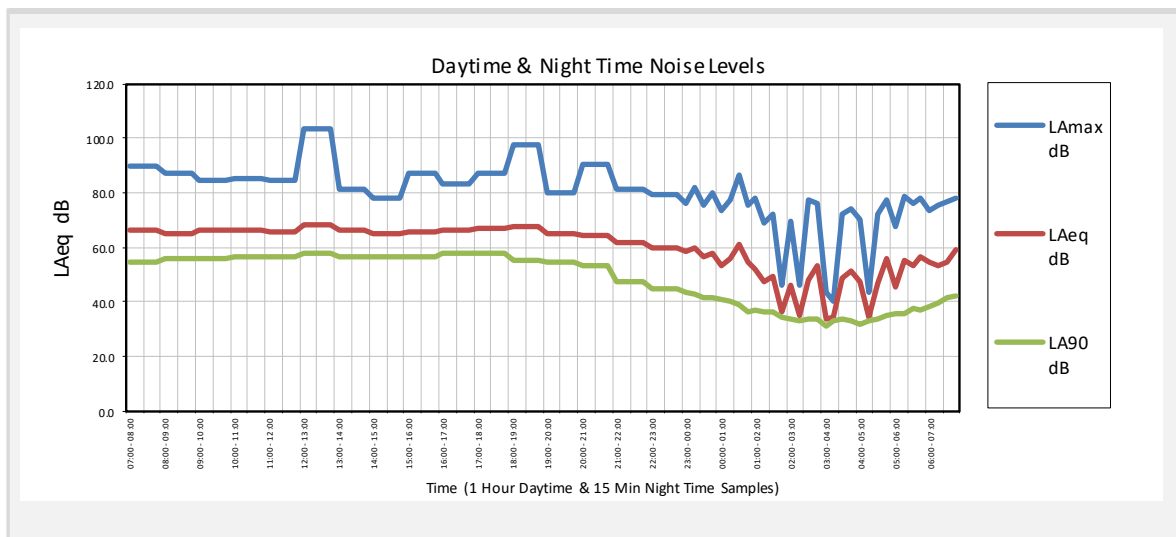


17.2 29<sup>th</sup> – 30<sup>th</sup> November 2024

| NOISE LEVEL SUMMARY ASSESSMENT                                                          |      |       |      | Octave Band Centre Frequency (Hz) |      |      |      |      |      |      |      |       |
|-----------------------------------------------------------------------------------------|------|-------|------|-----------------------------------|------|------|------|------|------|------|------|-------|
| Date / Time                                                                             | LAeq | LAmaz | LA90 | 63                                | 125  | 250  | 500  | 1.0k | 2.0k | 4.0k | 8.0k | 16.0k |
| DAYTIME 07:00 - 23:00<br><small>LAeq 16 HOUR &amp; Corresponding LAmaz 16 HOUR</small>  | 65.9 | 103.6 | 57.0 | 66.8                              | 62.1 | 61.2 | 59.9 | 63.2 | 58.8 | 47.8 | 40.9 | 32.3  |
| NIGHT TIME 23:00 - 07:00<br><small>LAeq 8 HOUR &amp; Corresponding LAmaz 8 HOUR</small> | 54.5 | 86.5  | 36.0 | 52.3                              | 52.7 | 51.5 | 48.8 | 51.2 | 47.3 | 40.9 | 38.0 | 23.3  |

| DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES |      |       |      | Octave Band Centre Frequency (Hz) |      |      |      |       |       |       |       |        |
|---------------------------------------------------|------|-------|------|-----------------------------------|------|------|------|-------|-------|-------|-------|--------|
| Date / Time                                       | LAeq | LAmaz | LA90 | 63                                | 125  | 250  | 500  | 1.0 k | 2.0 k | 4.0 k | 8.0 k | 16.0 k |
| 07:00 - 08:00                                     | 66.6 | 89.6  | 54.7 | 69.0                              | 64.6 | 64.8 | 613  | 63.5  | 59.2  | 48.9  | 42.0  | 30.3   |
| 08:00 - 09:00                                     | 65.2 | 87.0  | 56.1 | 65.9                              | 60.7 | 59.2 | 58.4 | 62.6  | 58.3  | 47.7  | 45.2  | 32.5   |
| 09:00 - 10:00                                     | 66.4 | 84.4  | 55.9 | 66.8                              | 62.6 | 61.7 | 59.8 | 63.9  | 59.4  | 48.5  | 42.1  | 32.3   |
| 10:00 - 11:00                                     | 66.2 | 85.0  | 56.5 | 69.0                              | 61.9 | 60.1 | 59.6 | 63.8  | 59.2  | 47.7  | 39.7  | 29.4   |
| 11:00 - 12:00                                     | 65.9 | 84.7  | 56.5 | 66.7                              | 61.9 | 59.5 | 59.0 | 63.4  | 58.9  | 47.0  | 38.8  | 39.3   |
| 12:00 - 13:00                                     | 68.3 | 103.6 | 57.8 | 68.1                              | 62.3 | 61.1 | 61.2 | 65.1  | 62.4  | 53.0  | 46.9  | 34.5   |
| 13:00 - 14:00                                     | 66.0 | 81.5  | 56.8 | 66.9                              | 62.3 | 61.3 | 59.7 | 63.6  | 58.8  | 47.2  | 38.6  | 29.4   |
| 14:00 - 15:00                                     | 65.2 | 78.2  | 56.6 | 67.8                              | 61.7 | 59.2 | 58.7 | 62.8  | 58.1  | 46.6  | 38.7  | 32.3   |
| 15:00 - 16:00                                     | 65.7 | 87.5  | 56.8 | 67.1                              | 62.7 | 61.6 | 59.8 | 63.0  | 58.5  | 48.6  | 39.1  | 35.3   |
| 16:00 - 17:00                                     | 66.6 | 83.0  | 57.8 | 68.9                              | 64.0 | 61.2 | 60.0 | 64.1  | 59.5  | 47.4  | 39.4  | 30.0   |
| 17:00 - 18:00                                     | 67.0 | 87.1  | 57.7 | 67.4                              | 64.3 | 62.1 | 60.3 | 64.5  | 60.0  | 48.0  | 38.9  | 28.3   |
| 18:00 - 19:00                                     | 67.4 | 97.5  | 54.9 | 67.2                              | 62.1 | 65.4 | 64.6 | 64.0  | 58.9  | 46.9  | 37.8  | 28.5   |
| 19:00 - 20:00                                     | 65.1 | 80.3  | 54.5 | 64.3                              | 58.9 | 57.9 | 58.2 | 62.8  | 58.1  | 46.2  | 38.3  | 27.6   |
| 20:00 - 21:00                                     | 64.6 | 90.5  | 52.9 | 63.7                              | 62.6 | 61.9 | 58.5 | 61.7  | 57.4  | 45.7  | 37.9  | 27.5   |
| 21:00 - 22:00                                     | 61.9 | 81.0  | 47.3 | 61.5                              | 57.9 | 55.0 | 55.1 | 59.5  | 54.9  | 42.9  | 35.1  | 27.9   |
| 22:00 - 23:00                                     | 60.0 | 79.6  | 44.8 | 59.0                              | 55.1 | 53.4 | 53.7 | 57.5  | 53.0  | 41.2  | 33.3  | 23.4   |

| NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES |      |       |      | Octave Band Centre Frequency (Hz) |      |      |      |       |       |       |       |        |
|---------------------------------------------------------|------|-------|------|-----------------------------------|------|------|------|-------|-------|-------|-------|--------|
| Date / Time                                             | LAeq | LAmaz | LA90 | 63                                | 125  | 250  | 500  | 1.0 k | 2.0 k | 4.0 k | 8.0 k | 16.0 k |
| 23:00 - 23:15                                           | 58.5 | 75.8  | 43.7 | 57.3                              | 52.0 | 51.6 | 54.0 | 55.7  | 51.1  | 39.3  | 32.0  | 21.7   |
| 23:15 - 23:30                                           | 60.0 | 82.2  | 42.9 | 53.4                              | 49.8 | 49.8 | 51.4 | 57.6  | 54.1  | 41.9  | 36.1  | 26.4   |
| 23:30 - 23:45                                           | 56.6 | 75.6  | 41.3 | 54.5                              | 49.4 | 49.2 | 49.9 | 54.5  | 49.2  | 38.3  | 32.2  | 20.9   |
| 23:45 - 00:00                                           | 57.9 | 79.9  | 41.8 | 54.6                              | 48.6 | 49.2 | 50.3 | 55.6  | 51.2  | 39.6  | 32.9  | 22.4   |
| 00:00 - 00:15                                           | 53.0 | 73.4  | 40.7 | 49.5                              | 47.0 | 45.6 | 45.1 | 50.6  | 46.1  | 35.1  | 27.9  | 17.3   |
| 00:15 - 00:30                                           | 55.8 | 77.1  | 40.3 | 49.7                              | 47.1 | 47.4 | 48.2 | 53.4  | 48.9  | 39.3  | 33.9  | 23.2   |
| 00:30 - 00:45                                           | 61.2 | 86.5  | 39.0 | 58.8                              | 66.0 | 65.0 | 59.7 | 54.5  | 49.8  | 40.8  | 30.8  | 21.4   |
| 00:45 - 01:00                                           | 54.7 | 75.3  | 36.1 | 51.7                              | 44.2 | 45.2 | 46.6 | 52.6  | 47.6  | 37.0  | 31.1  | 20.8   |
| 01:00 - 01:15                                           | 52.1 | 78.3  | 36.7 | 51.5                              | 49.3 | 45.5 | 47.5 | 49.0  | 45.1  | 35.9  | 26.8  | 15.0   |
| 01:15 - 01:30                                           | 47.4 | 69.2  | 36.2 | 47.2                              | 40.2 | 40.1 | 40.9 | 45.2  | 39.8  | 27.7  | 20.5  | 12.4   |
| 01:30 - 01:45                                           | 49.7 | 72.4  | 36.5 | 45.9                              | 41.2 | 42.1 | 41.6 | 47.5  | 42.5  | 29.8  | 21.9  | 13.6   |
| 01:45 - 02:00                                           | 36.2 | 46.4  | 34.2 | 41.9                              | 36.0 | 32.1 | 32.2 | 34.1  | 25.2  | 13.1  | 11.2  | 9.5    |
| 02:00 - 02:15                                           | 46.0 | 69.7  | 33.8 | 44.2                              | 38.8 | 37.8 | 38.2 | 43.4  | 39.6  | 29.5  | 20.9  | 12.6   |
| 02:15 - 02:30                                           | 34.9 | 45.8  | 33.0 | 41.0                              | 34.0 | 31.2 | 31.3 | 32.8  | 23.6  | 12.7  | 11.2  | 9.5    |
| 02:30 - 02:45                                           | 48.4 | 77.2  | 33.7 | 50.8                              | 42.0 | 41.4 | 40.2 | 45.9  | 41.5  | 32.0  | 27.9  | 18.5   |
| 02:45 - 03:00                                           | 53.4 | 75.8  | 33.5 | 47.1                              | 43.4 | 44.5 | 45.0 | 51.0  | 46.9  | 36.5  | 31.2  | 20.6   |
| 03:00 - 03:15                                           | 33.7 | 43.5  | 31.3 | 41.5                              | 33.5 | 30.0 | 30.8 | 31.4  | 21.7  | 12.9  | 11.3  | 9.5    |
| 03:15 - 03:30                                           | 34.7 | 40.2  | 33.1 | 41.6                              | 34.5 | 31.2 | 31.5 | 32.2  | 23.1  | 14.4  | 12.5  | 9.6    |
| 03:30 - 03:45                                           | 48.9 | 72.4  | 33.5 | 47.1                              | 41.5 | 42.0 | 41.7 | 46.3  | 42.2  | 31.1  | 23.4  | 14.4   |
| 03:45 - 04:00                                           | 51.1 | 74.1  | 33.3 | 51.1                              | 45.6 | 42.8 | 43.5 | 48.8  | 44.1  | 33.6  | 27.2  | 16.8   |
| 04:00 - 04:15                                           | 47.5 | 70.2  | 31.9 | 48.6                              | 42.2 | 40.3 | 39.6 | 44.7  | 40.7  | 34.5  | 29.1  | 18.8   |
| 04:15 - 04:30                                           | 34.7 | 43.2  | 33.1 | 41.0                              | 34.2 | 30.0 | 30.5 | 32.1  | 25.2  | 20.4  | 16.1  | 11.0   |
| 04:30 - 04:45                                           | 46.9 | 72.4  | 33.6 | 46.5                              | 39.3 | 39.0 | 38.6 | 43.9  | 40.7  | 34.3  | 27.6  | 16.9   |
| 04:45 - 05:00                                           | 55.7 | 77.7  | 34.8 | 50.9                              | 50.9 | 46.2 | 47.8 | 52.7  | 49.2  | 43.5  | 37.1  | 25.2   |
| 05:00 - 05:15                                           | 45.8 | 67.9  | 35.5 | 42.7                              | 35.2 | 34.1 | 36.0 | 38.8  | 37.0  | 41.4  | 37.0  | 16.2   |
| 05:15 - 05:30                                           | 55.4 | 78.8  | 35.6 | 49.5                              | 44.5 | 45.1 | 47.4 | 51.3  | 49.1  | 45.1  | 45.5  | 28.8   |
| 05:30 - 05:45                                           | 53.4 | 76.0  | 37.5 | 46.4                              | 42.9 | 43.0 | 43.6 | 49.6  | 46.8  | 45.0  | 41.1  | 23.5   |
| 05:45 - 06:00                                           | 56.7 | 78.1  | 37.1 | 52.6                              | 46.3 | 47.2 | 48.6 | 53.1  | 50.6  | 46.7  | 40.0  | 28.1   |
| 06:00 - 06:15                                           | 54.8 | 73.7  | 38.4 | 49.6                              | 44.0 | 45.8 | 46.2 | 51.2  | 48.5  | 45.2  | 41.2  | 25.4   |
| 06:15 - 06:30                                           | 53.0 | 75.7  | 39.3 | 50.7                              | 43.7 | 43.5 | 44.4 | 49.5  | 46.6  | 43.5  | 37.2  | 23.8   |
| 06:30 - 06:45                                           | 54.7 | 76.7  | 41.6 | 58.4                              | 49.9 | 47.4 | 47.1 | 49.8  | 47.2  | 44.4  | 48.8  | 32.2   |
| 06:45 - 07:00                                           | 59.3 | 77.8  | 42.0 | 59.3                              | 59.4 | 56.6 | 53.2 | 55.8  | 51.9  | 48.4  | 43.1  | 28.2   |

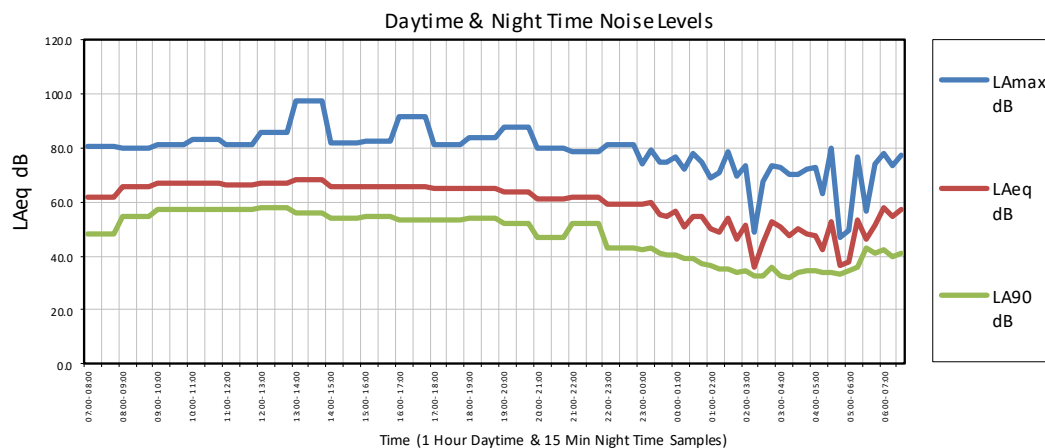


17.3 30<sup>th</sup> November – 1<sup>st</sup> December 2024

| NOISE LEVEL SUMMARY ASSESSMENT                                                           |      |      |      | Octave Band Centre Frequency (Hz) |      |      |      |      |      |      |      |       |
|------------------------------------------------------------------------------------------|------|------|------|-----------------------------------|------|------|------|------|------|------|------|-------|
| Date / Time                                                                              | LAeq | LAmx | LA90 | 63                                | 125  | 250  | 500  | 1.0k | 2.0k | 4.0k | 8.0k | 16.0k |
| DAYTIME 07:00 - 23:00<br><small>LAeq 16 HOUR &amp; Cor r esponding LAmx 16 HOUR</small>  | 65.2 | 97.3 | 54.0 | 65.1                              | 60.6 | 59.7 | 58.9 | 62.6 | 58.1 | 48.7 | 42.5 | 32.1  |
| NIGHT TIME 23:00 - 07:00<br><small>LAeq 8 HOUR &amp; Cor r esponding LAmx 8 HOUR</small> | 53.6 | 80.0 | 34.0 | 52.8                              | 49.3 | 46.7 | 46.3 | 50.6 | 47.2 | 40.4 | 33.7 | 24.5  |

| DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES |      |      |      |                                   |      |      |      |       |       |       |       |        |
|---------------------------------------------------|------|------|------|-----------------------------------|------|------|------|-------|-------|-------|-------|--------|
| Date / Time                                       | LAeq | LAmx | 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                                     | 61.8 | 80.6 | 47.9 | 61.0                              | 53.8 | 54.5 | 54.4 | 59.3  | 55.0  | 47.5  | 41.9  | 29.4   |
| 08:00 - 09:00                                     | 65.3 | 79.6 | 54.3 | 64.7                              | 59.9 | 57.5 | 57.7 | 62.8  | 58.5  | 50.3  | 44.4  | 33.1   |
| 09:00 - 10:00                                     | 66.9 | 81.4 | 57.4 | 66.7                              | 61.3 | 59.5 | 59.5 | 64.4  | 60.1  | 51.5  | 46.5  | 35.0   |
| 10:00 - 11:00                                     | 66.8 | 83.1 | 57.3 | 66.6                              | 60.8 | 59.5 | 59.6 | 64.4  | 59.9  | 50.9  | 45.1  | 34.7   |
| 11:00 - 12:00                                     | 66.5 | 81.3 | 56.9 | 66.8                              | 62.4 | 60.6 | 59.5 | 64.0  | 59.4  | 50.3  | 44.4  | 33.7   |
| 12:00 - 13:00                                     | 67.0 | 85.8 | 57.5 | 67.7                              | 63.2 | 60.8 | 60.3 | 64.6  | 59.9  | 50.2  | 42.9  | 32.7   |
| 13:00 - 14:00                                     | 68.0 | 97.3 | 55.7 | 67.8                              | 63.5 | 66.6 | 65.1 | 64.4  | 59.3  | 49.2  | 42.4  | 34.7   |
| 14:00 - 15:00                                     | 65.4 | 81.8 | 53.7 | 65.6                              | 60.7 | 59.3 | 58.7 | 63.0  | 58.2  | 47.6  | 40.9  | 31.9   |
| 15:00 - 16:00                                     | 65.8 | 82.7 | 54.8 | 65.7                              | 62.6 | 61.3 | 59.1 | 63.4  | 58.5  | 47.6  | 41.0  | 30.9   |
| 16:00 - 17:00                                     | 65.6 | 91.6 | 53.5 | 65.3                              | 60.1 | 58.5 | 58.1 | 63.0  | 58.8  | 49.7  | 42.0  | 32.7   |
| 17:00 - 18:00                                     | 65.1 | 81.0 | 53.1 | 64.6                              | 60.5 | 58.8 | 58.1 | 62.6  | 58.0  | 47.8  | 41.5  | 31.5   |
| 18:00 - 19:00                                     | 64.7 | 83.7 | 53.8 | 64.1                              | 58.2 | 58.4 | 57.4 | 62.3  | 57.9  | 48.4  | 42.2  | 31.9   |
| 19:00 - 20:00                                     | 63.7 | 87.8 | 52.0 | 63.2                              | 61.9 | 57.1 | 56.5 | 61.2  | 56.7  | 46.6  | 39.9  | 31.9   |
| 20:00 - 21:00                                     | 61.0 | 79.6 | 46.5 | 60.6                              | 55.8 | 53.6 | 53.7 | 58.6  | 54.1  | 44.1  | 37.5  | 27.1   |
| 21:00 - 22:00                                     | 61.8 | 78.8 | 51.7 | 62.7                              | 58.2 | 54.8 | 54.6 | 59.2  | 55.0  | 45.0  | 38.5  | 27.9   |
| 22:00 - 23:00                                     | 59.1 | 81.3 | 42.9 | 57.2                              | 55.0 | 52.1 | 51.9 | 56.5  | 52.4  | 42.1  | 35.3  | 25.1   |

| NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES |      |      |      |                                   |      |      |      |       |       |       |       |        |
|---------------------------------------------------------|------|------|------|-----------------------------------|------|------|------|-------|-------|-------|-------|--------|
| Date / Time                                             | LAeq | LAmx | 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                                           | 58.9 | 74.3 | 42.3 | 56.2                              | 51.1 | 51.2 | 51.6 | 56.5  | 52.0  | 36.1  | 25.8  |        |
| 23:15 - 23:30                                           | 59.6 | 79.0 | 42.6 | 56.2                              | 54.2 | 52.7 | 52.9 | 57.0  | 52.5  | 43.9  | 37.5  | 26.8   |
| 23:30 - 23:45                                           | 55.1 | 74.5 | 41.0 | 54.7                              | 48.0 | 47.6 | 47.7 | 52.8  | 48.0  | 37.2  | 31.0  | 21.3   |
| 23:45 - 00:00                                           | 54.6 | 74.6 | 40.5 | 55.6                              | 48.2 | 47.2 | 46.9 | 51.8  | 48.3  | 38.6  | 32.5  | 22.1   |
| 00:00 - 00:15                                           | 56.3 | 76.8 | 40.0 | 56.5                              | 50.6 | 48.6 | 48.6 | 53.8  | 49.7  | 40.0  | 33.2  | 22.4   |
| 00:15 - 00:30                                           | 50.4 | 72.2 | 38.9 | 49.0                              | 45.9 | 43.5 | 43.2 | 48.1  | 43.1  | 34.0  | 27.0  | 17.1   |
| 00:30 - 00:45                                           | 54.6 | 77.6 | 39.1 | 51.1                              | 47.4 | 47.6 | 48.7 | 52.5  | 46.8  | 37.0  | 29.7  | 19.1   |
| 00:45 - 01:00                                           | 54.4 | 74.5 | 37.1 | 49.8                              | 45.4 | 46.6 | 46.9 | 51.9  | 47.6  | 36.9  | 29.6  | 19.7   |
| 01:00 - 01:15                                           | 50.1 | 68.8 | 36.6 | 50.0                              | 45.4 | 45.8 | 42.0 | 47.3  | 43.6  | 33.4  | 26.7  | 16.3   |
| 01:15 - 01:30                                           | 49.0 | 70.9 | 35.2 | 49.2                              | 43.0 | 41.6 | 40.8 | 46.5  | 42.3  | 32.3  | 26.1  | 16.2   |
| 01:30 - 01:45                                           | 54.2 | 78.6 | 35.5 | 51.1                              | 51.4 | 48.8 | 46.7 | 51.5  | 47.4  | 37.5  | 30.9  | 21.2   |
| 01:45 - 02:00                                           | 46.2 | 69.6 | 33.8 | 47.0                              | 42.7 | 40.3 | 38.5 | 43.6  | 39.2  | 30.0  | 23.5  | 14.0   |
| 02:00 - 02:15                                           | 51.1 | 73.4 | 34.4 | 51.9                              | 46.6 | 44.6 | 43.4 | 48.7  | 43.9  | 35.7  | 30.3  | 19.4   |
| 02:15 - 02:30                                           | 35.5 | 48.5 | 32.9 | 45.4                              | 38.9 | 33.9 | 30.7 | 32.8  | 24.8  | 16.8  | 14.0  | 9.8    |
| 02:30 - 02:45                                           | 45.2 | 67.6 | 32.9 | 45.0                              | 39.5 | 38.2 | 36.7 | 42.9  | 38.4  | 28.4  | 21.6  | 12.5   |
| 02:45 - 03:00                                           | 52.4 | 73.1 | 35.5 | 57.5                              | 52.1 | 48.7 | 46.8 | 49.8  | 44.7  | 35.3  | 28.6  | 27.7   |
| 03:00 - 03:15                                           | 50.7 | 72.6 | 32.5 | 46.9                              | 40.8 | 41.6 | 42.7 | 48.1  | 44.5  | 34.3  | 26.9  | 16.0   |
| 03:15 - 03:30                                           | 47.6 | 69.9 | 31.7 | 47.3                              | 44.1 | 41.5 | 40.4 | 45.3  | 40.2  | 30.3  | 22.4  | 13.4   |
| 03:30 - 03:45                                           | 49.9 | 70.2 | 34.0 | 47.5                              | 43.1 | 42.8 | 42.2 | 47.8  | 42.7  | 33.5  | 26.7  | 33.9   |
| 03:45 - 04:00                                           | 48.0 | 71.8 | 34.2 | 46.9                              | 41.1 | 39.9 | 40.2 | 46.0  | 40.2  | 29.7  | 22.1  | 12.7   |
| 04:00 - 04:15                                           | 47.4 | 72.6 | 34.3 | 51.0                              | 42.6 | 40.8 | 40.8 | 44.6  | 40.6  | 31.9  | 25.5  | 16.1   |
| 04:15 - 04:30                                           | 42.3 | 62.9 | 33.8 | 47.9                              | 40.5 | 36.4 | 36.1 | 38.3  | 33.7  | 33.6  | 31.8  | 13.7   |
| 04:30 - 04:45                                           | 52.6 | 80.0 | 33.7 | 47.7                              | 41.7 | 42.0 | 45.1 | 49.8  | 46.5  | 37.6  | 33.0  | 22.9   |
| 04:45 - 05:00                                           | 36.5 | 46.7 | 33.4 | 44.6                              | 37.5 | 33.9 | 31.5 | 32.2  | 26.4  | 28.8  | 21.7  | 11.8   |
| 05:00 - 05:15                                           | 37.6 | 49.2 | 34.6 | 45.4                              | 38.5 | 35.1 | 33.3 | 33.3  | 27.9  | 28.6  | 23.6  | 13.5   |
| 05:15 - 05:30                                           | 53.3 | 76.4 | 35.6 | 47.4                              | 44.2 | 44.2 | 44.6 | 50.8  | 47.1  | 38.2  | 31.6  | 20.8   |
| 05:30 - 05:45                                           | 46.0 | 56.2 | 42.8 | 49.6                              | 45.6 | 42.4 | 39.8 | 40.4  | 39.0  | 38.2  | 34.0  | 23.7   |
| 05:45 - 06:00                                           | 51.2 | 74.3 | 41.2 | 49.2                              | 51.2 | 43.6 | 42.6 | 46.3  | 45.7  | 42.3  | 35.8  | 25.1   |
| 06:00 - 06:15                                           | 58.0 | 77.9 | 42.2 | 54.6                              | 49.1 | 47.4 | 48.0 | 52.6  | 53.2  | 49.2  | 41.7  | 30.7   |
| 06:15 - 06:30                                           | 54.5 | 73.3 | 39.8 | 50.3                              | 46.2 | 45.3 | 45.5 | 50.6  | 48.6  | 45.0  | 37.7  | 25.9   |
| 06:30 - 06:45                                           | 57.0 | 77.2 | 40.8 | 52.5                              | 46.6 | 47.7 | 48.9 | 53.5  | 51.2  | 45.9  | 39.0  | 27.9   |
| 06:45 - 07:00                                           | 58.9 | 78.7 | 42.3 | 61.5                              | 60.2 | 54.9 | 53.0 | 54.7  | 52.4  | 47.6  | 40.7  | 29.6   |

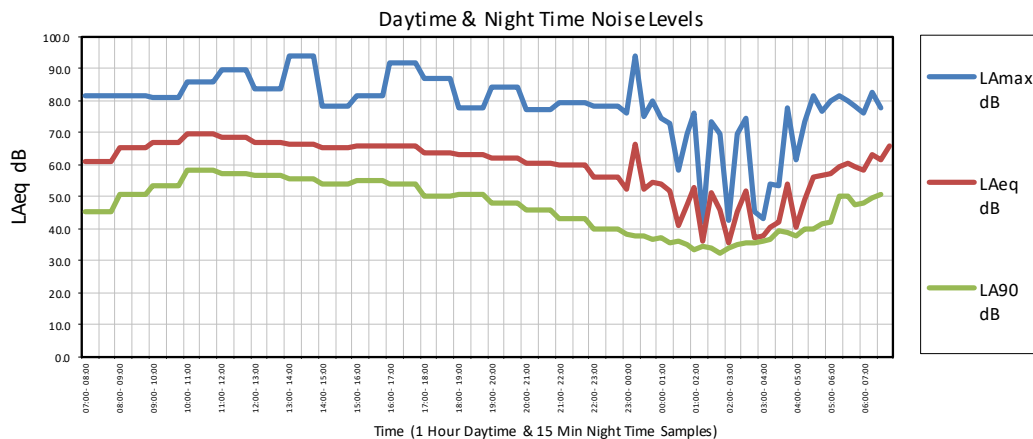


## 17.4 1<sup>st</sup> – 2<sup>nd</sup> December 2024

| 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<br><small>LAeq 16 HOUR &amp; Cor r esponding LAmax 16 HOUR</small>  | 65.3 | 93.8  | 50.0 | 63.2                              | 60.1 | 58.5 | 57.6 | 61.9 | 59.3 | 53.1 | 46.0 | 36.0  |
| NIGHT TIME 23:00 - 07:00<br><small>LAeq 8 HOUR &amp; Cor r esponding LAmax 8 HOUR</small> | 57.6 | 94.2  | 36.0 | 55.9                              | 52.9 | 54.5 | 54.7 | 54.0 | 49.8 | 42.0 | 36.2 | 24.1  |

| DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES |      |      |      |      |      |      |      |       |       |       |       |        |
|---------------------------------------------------|------|------|------|------|------|------|------|-------|-------|-------|-------|--------|
| Date / Time                                       | LAeq | LAmx | LA90 | 63   | 125  | 250  | 500  | 1.0 k | 2.0 k | 4.0 k | 8.0 k | 16.0 k |
| 07:00 - 08:00                                     | 61.1 | 81.3 | 45.2 | 56.5 | 51.3 | 51.0 | 52.2 | 57.3  | 55.4  | 50.7  | 44.5  | 33.0   |
| 08:00 - 09:00                                     | 65.4 | 81.5 | 50.4 | 61.1 | 57.0 | 55.3 | 55.8 | 60.8  | 60.5  | 55.5  | 48.3  | 38.4   |
| 09:00 - 10:00                                     | 67.1 | 81.1 | 53.5 | 64.0 | 61.4 | 57.1 | 58.0 | 62.9  | 61.8  | 56.8  | 49.3  | 39.5   |
| 10:00 - 11:00                                     | 69.4 | 85.7 | 58.1 | 64.2 | 60.4 | 58.6 | 59.6 | 64.8  | 64.5  | 59.6  | 51.9  | 42.4   |
| 11:00 - 12:00                                     | 68.5 | 89.6 | 57.0 | 64.9 | 60.0 | 58.7 | 59.8 | 64.7  | 63.0  | 57.9  | 50.5  | 40.5   |
| 12:00 - 13:00                                     | 66.8 | 83.7 | 56.6 | 65.1 | 60.5 | 59.0 | 59.0 | 63.9  | 60.2  | 53.8  | 47.1  | 36.2   |
| 13:00 - 14:00                                     | 66.2 | 93.8 | 55.7 | 65.4 | 62.7 | 60.6 | 58.8 | 63.6  | 59.5  | 51.4  | 45.1  | 35.0   |
| 14:00 - 15:00                                     | 65.5 | 78.4 | 54.1 | 65.4 | 60.1 | 58.3 | 58.0 | 63.0  | 58.6  | 49.3  | 43.2  | 33.0   |
| 15:00 - 16:00                                     | 65.8 | 81.5 | 54.9 | 66.0 | 63.3 | 58.7 | 58.5 | 63.3  | 59.0  | 49.7  | 43.3  | 32.9   |
| 16:00 - 17:00                                     | 65.9 | 91.7 | 53.6 | 63.6 | 60.0 | 65.8 | 61.6 | 62.3  | 57.8  | 48.9  | 42.8  | 32.5   |
| 17:00 - 18:00                                     | 63.8 | 87.0 | 50.0 | 62.4 | 63.0 | 58.5 | 57.8 | 61.1  | 56.9  | 47.0  | 40.3  | 30.0   |
| 18:00 - 19:00                                     | 63.0 | 77.6 | 50.8 | 60.4 | 56.3 | 55.1 | 55.6 | 60.6  | 56.2  | 46.5  | 40.2  | 29.8   |
| 19:00 - 20:00                                     | 62.2 | 84.1 | 47.8 | 63.2 | 61.4 | 55.5 | 55.7 | 59.5  | 55.3  | 45.6  | 39.0  | 28.6   |
| 20:00 - 21:00                                     | 60.6 | 77.4 | 45.8 | 58.6 | 55.7 | 52.9 | 53.2 | 58.0  | 54.0  | 44.3  | 37.9  | 27.4   |
| 21:00 - 22:00                                     | 59.6 | 79.3 | 42.9 | 61.4 | 58.7 | 53.2 | 51.9 | 57.0  | 52.8  | 43.5  | 37.1  | 26.9   |
| 22:00 - 23:00                                     | 55.8 | 78.2 | 39.7 | 54.0 | 49.6 | 47.9 | 47.8 | 53.3  | 49.5  | 39.5  | 32.9  | 22.8   |

| NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES |      |      |      |      |      |      |      |       |       |       |       |        |
|---------------------------------------------------------|------|------|------|------|------|------|------|-------|-------|-------|-------|--------|
| Date / Time                                             | LAeq | LAmx | LA90 | 63   | 125  | 250  | 500  | 1.0 k | 2.0 k | 4.0 k | 8.0 k | 16.0 k |
| 23:00 - 23:15                                           | 52.1 | 76.2 | 38.2 | 50.2 | 43.9 | 44.1 | 44.7 | 49.9  | 45.0  | 34.2  | 27.8  | 18.0   |
| 23:15 - 23:30                                           | 66.4 | 94.2 | 37.6 | 58.0 | 61.5 | 67.3 | 67.9 | 58.4  | 49.3  | 40.0  | 32.0  | 22.1   |
| 23:30 - 23:45                                           | 52.3 | 74.8 | 37.7 | 48.8 | 44.2 | 43.9 | 44.5 | 50.0  | 45.4  | 35.9  | 29.4  | 18.9   |
| 23:45 - 00:00                                           | 54.2 | 80.1 | 36.4 | 51.7 | 53.5 | 46.4 | 45.9 | 51.9  | 47.3  | 35.5  | 28.0  | 18.1   |
| 00:00 - 00:15                                           | 54.1 | 74.7 | 36.9 | 53.4 | 47.9 | 46.0 | 45.9 | 51.7  | 47.5  | 36.8  | 30.6  | 20.6   |
| 00:15 - 00:30                                           | 51.8 | 72.7 | 35.4 | 50.2 | 43.9 | 43.8 | 45.4 | 49.1  | 45.4  | 34.7  | 28.6  | 23.2   |
| 00:30 - 00:45                                           | 40.9 | 58.1 | 36.1 | 46.7 | 41.2 | 38.9 | 36.7 | 37.7  | 32.9  | 25.2  | 19.7  | 12.5   |
| 00:45 - 01:00                                           | 47.2 | 69.7 | 34.8 | 50.0 | 46.1 | 42.2 | 40.5 | 44.6  | 39.7  | 32.4  | 25.6  | 15.4   |
| 01:00 - 01:15                                           | 52.8 | 76.3 | 33.5 | 49.2 | 44.1 | 43.1 | 44.6 | 50.2  | 46.8  | 36.2  | 29.7  | 20.1   |
| 01:15 - 01:30                                           | 35.9 | 42.0 | 34.1 | 43.5 | 35.9 | 31.8 | 32.8 | 33.6  | 23.6  | 12.9  | 11.2  | 9.5    |
| 01:30 - 01:45                                           | 51.1 | 73.1 | 34.0 | 52.1 | 47.0 | 43.0 | 43.1 | 48.5  | 44.8  | 34.7  | 27.7  | 17.2   |
| 01:45 - 02:00                                           | 45.7 | 69.4 | 32.2 | 43.7 | 41.0 | 38.8 | 37.7 | 43.0  | 39.4  | 28.2  | 19.9  | 11.5   |
| 02:00 - 02:15                                           | 35.6 | 42.4 | 33.9 | 43.3 | 37.6 | 33.1 | 32.3 | 33.1  | 23.8  | 13.7  | 11.7  | 9.5    |
| 02:15 - 02:30                                           | 45.3 | 69.4 | 34.7 | 43.2 | 37.9 | 36.0 | 35.7 | 42.7  | 39.7  | 24.9  | 16.9  | 10.0   |
| 02:30 - 02:45                                           | 52.0 | 74.5 | 35.6 | 49.2 | 46.6 | 44.8 | 44.3 | 49.7  | 44.6  | 35.2  | 28.2  | 17.7   |
| 02:45 - 03:00                                           | 37.2 | 45.3 | 35.6 | 43.3 | 37.1 | 34.4 | 33.9 | 34.8  | 25.5  | 19.1  | 14.7  | 9.8    |
| 03:00 - 03:15                                           | 37.4 | 43.1 | 36.0 | 43.2 | 38.1 | 34.7 | 33.7 | 35.0  | 25.8  | 17.9  | 14.3  | 9.8    |
| 03:15 - 03:30                                           | 40.6 | 53.8 | 36.4 | 42.9 | 37.5 | 34.1 | 34.2 | 35.8  | 34.1  | 32.1  | 18.0  | 10.8   |
| 03:30 - 03:45                                           | 42.1 | 53.3 | 39.4 | 45.9 | 40.5 | 38.1 | 37.7 | 39.0  | 32.8  | 30.0  | 26.2  | 15.9   |
| 03:45 - 04:00                                           | 53.9 | 77.6 | 38.8 | 51.3 | 47.2 | 45.0 | 45.3 | 51.2  | 47.4  | 40.2  | 34.3  | 23.4   |
| 04:00 - 04:15                                           | 40.4 | 61.3 | 37.9 | 42.2 | 37.1 | 35.0 | 34.9 | 37.8  | 29.3  | 31.2  | 26.4  | 11.2   |
| 04:15 - 04:30                                           | 48.7 | 73.1 | 40.0 | 55.5 | 46.2 | 42.9 | 41.9 | 45.8  | 41.8  | 34.5  | 26.6  | 14.9   |
| 04:30 - 04:45                                           | 56.1 | 81.7 | 39.7 | 48.7 | 47.6 | 46.9 | 48.8 | 52.3  | 49.7  | 46.3  | 41.3  | 25.4   |
| 04:45 - 05:00                                           | 56.6 | 76.8 | 41.2 | 53.0 | 50.5 | 47.6 | 48.2 | 54.0  | 50.2  | 41.3  | 34.6  | 23.2   |
| 05:00 - 05:15                                           | 57.1 | 79.9 | 42.0 | 55.7 | 51.8 | 52.8 | 51.7 | 54.1  | 49.7  | 43.0  | 36.3  | 25.3   |
| 05:15 - 05:30                                           | 59.5 | 81.5 | 49.8 | 61.7 | 56.1 | 53.2 | 52.4 | 55.7  | 53.3  | 47.8  | 45.2  | 29.2   |
| 05:30 - 05:45                                           | 60.6 | 80.1 | 49.9 | 62.4 | 62.3 | 60.7 | 56.8 | 56.3  | 52.9  | 45.7  | 37.8  | 24.7   |
| 05:45 - 06:00                                           | 59.3 | 78.3 | 47.5 | 57.1 | 53.3 | 51.5 | 51.8 | 56.6  | 52.5  | 46.0  | 40.7  | 27.5   |
| 06:00 - 06:15                                           | 58.5 | 76.3 | 47.7 | 57.3 | 50.3 | 50.4 | 51.8 | 56.1  | 51.2  | 42.8  | 36.3  | 25.9   |
| 06:15 - 06:30                                           | 63.3 | 82.6 | 49.8 | 61.1 | 57.2 | 56.5 | 57.8 | 60.3  | 56.5  | 48.5  | 42.0  | 31.6   |
| 06:30 - 06:45                                           | 61.4 | 77.9 | 50.4 | 62.0 | 53.5 | 52.6 | 53.8 | 59.1  | 54.6  | 44.9  | 37.8  | 26.3   |
| 06:45 - 07:00                                           | 65.5 | 80.2 | 53.4 | 63.3 | 58.1 | 58.1 | 58.5 | 62.9  | 58.8  | 50.4  | 43.9  | 33.0   |

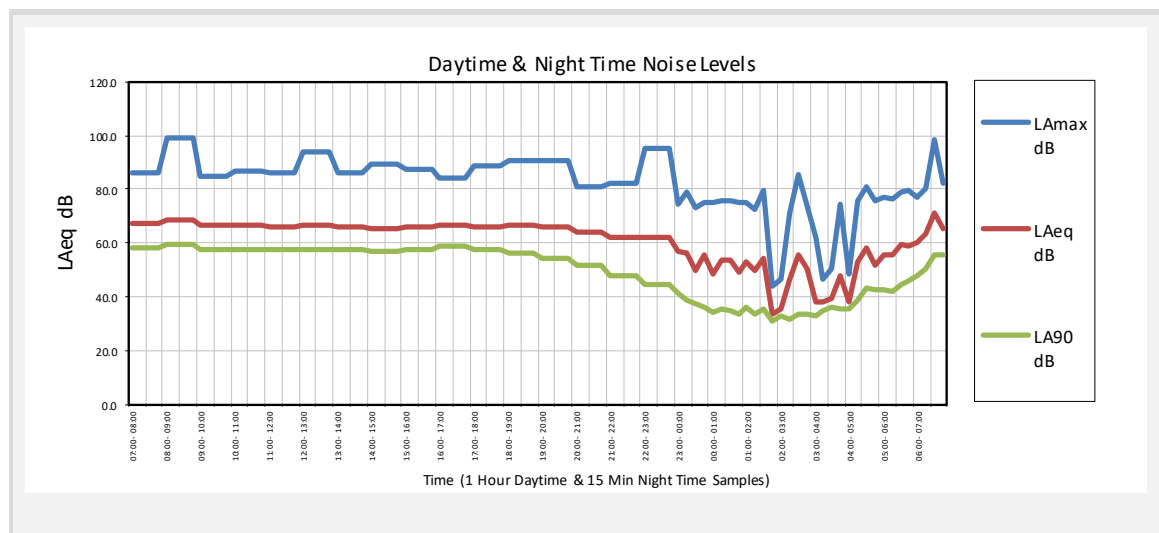


17.5 2<sup>nd</sup> – 3<sup>rd</sup> December 2024

| NOISE LEVEL SUMMARY ASSESSMENT                                                            |      |       |      | Octave Band Centre Frequency (Hz) |      |      |      |      |      |      |      |       |
|-------------------------------------------------------------------------------------------|------|-------|------|-----------------------------------|------|------|------|------|------|------|------|-------|
| Date / Time                                                                               | LAeq | LAmaz | LA90 | 63                                | 125  | 250  | 500  | 1.0k | 2.0k | 4.0k | 8.0k | 16.0k |
| DAYTIME 07:00 - 23:00<br><small>LAeq 16 HOUR &amp; Cor r esponding LAmaz 16 HOUR</small>  | 66.0 | 99.2  | 58.0 | 67.0                              | 62.9 | 62.3 | 60.2 | 63.2 | 58.6 | 48.2 | 42.7 | 34.6  |
| NIGHT TIME 23:00 - 07:00<br><small>LAeq 8 HOUR &amp; Cor r esponding LAmaz 8 HOUR</small> | 59.2 | 98.6  | 35.0 | 57.6                              | 54.3 | 57.2 | 57.2 | 55.0 | 50.7 | 42.9 | 35.5 | 23.6  |

| DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES |      |       |      |                                   |      |      |      |       |       |       |       |        |
|---------------------------------------------------|------|-------|------|-----------------------------------|------|------|------|-------|-------|-------|-------|--------|
| Date / Time                                       | LAeq | LAmaz | 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                                     | 67.2 | 86.4  | 58.1 | 68.6                              | 63.3 | 60.0 | 59.9 | 64.7  | 60.4  | 51.4  | 49.0  | 35.0   |
| 08:00 - 09:00                                     | 68.7 | 99.2  | 59.4 | 69.8                              | 65.2 | 68.4 | 64.8 | 65.2  | 60.6  | 52.9  | 48.8  | 44.4   |
| 09:00 - 10:00                                     | 66.4 | 84.9  | 57.5 | 68.1                              | 62.2 | 60.0 | 59.5 | 63.9  | 59.5  | 50.1  | 44.3  | 32.7   |
| 10:00 - 11:00                                     | 66.4 | 86.6  | 57.6 | 68.1                              | 63.3 | 62.3 | 60.1 | 63.8  | 59.2  | 49.6  | 45.9  | 35.7   |
| 11:00 - 12:00                                     | 66.1 | 86.4  | 57.7 | 67.7                              | 62.7 | 60.5 | 59.6 | 63.7  | 58.9  | 47.6  | 39.5  | 29.9   |
| 12:00 - 13:00                                     | 66.3 | 93.9  | 57.4 | 67.0                              | 64.6 | 64.4 | 60.5 | 63.5  | 58.7  | 47.1  | 38.1  | 30.6   |
| 13:00 - 14:00                                     | 65.9 | 86.0  | 57.4 | 65.9                              | 62.1 | 59.7 | 59.2 | 63.5  | 58.7  | 46.5  | 38.7  | 30.1   |
| 14:00 - 15:00                                     | 65.3 | 89.6  | 57.0 | 66.7                              | 62.7 | 61.0 | 59.4 | 62.6  | 58.0  | 46.8  | 38.1  | 32.4   |
| 15:00 - 16:00                                     | 66.0 | 87.7  | 57.6 | 66.9                              | 63.5 | 61.5 | 60.7 | 63.2  | 58.6  | 47.8  | 39.4  | 29.6   |
| 16:00 - 17:00                                     | 66.4 | 84.0  | 58.6 | 69.3                              | 64.1 | 61.0 | 59.7 | 63.9  | 59.2  | 47.5  | 39.4  | 28.0   |
| 17:00 - 18:00                                     | 66.2 | 88.9  | 57.7 | 67.2                              | 61.4 | 59.6 | 59.6 | 63.9  | 59.1  | 46.6  | 36.8  | 28.5   |
| 18:00 - 19:00                                     | 66.5 | 90.5  | 56.5 | 66.3                              | 63.7 | 64.2 | 60.9 | 63.7  | 58.9  | 46.3  | 37.3  | 29.4   |
| 19:00 - 20:00                                     | 65.6 | 90.4  | 54.3 | 64.1                              | 62.5 | 64.1 | 60.3 | 62.7  | 58.0  | 45.4  | 35.7  | 27.0   |
| 20:00 - 21:00                                     | 63.9 | 80.9  | 51.6 | 63.8                              | 61.6 | 58.4 | 57.1 | 61.4  | 56.9  | 45.3  | 37.6  | 27.2   |
| 21:00 - 22:00                                     | 61.9 | 81.9  | 47.8 | 62.0                              | 59.3 | 54.9 | 54.6 | 59.3  | 55.0  | 44.1  | 35.4  | 25.0   |
| 22:00 - 23:00                                     | 62.2 | 95.3  | 44.6 | 59.7                              | 60.8 | 59.9 | 60.2 | 58.1  | 53.4  | 44.7  | 37.7  | 25.8   |

| NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES |      |       |      |                                   |      |      |      |       |       |       |       |        |
|---------------------------------------------------------|------|-------|------|-----------------------------------|------|------|------|-------|-------|-------|-------|--------|
| Date / Time                                             | LAeq | LAmaz | 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                                           | 56.6 | 74.5  | 41.5 | 55.6                              | 50.2 | 48.2 | 48.5 | 54.1  | 50.0  | 41.3  | 34.3  | 22.2   |
| 23:15 - 23:30                                           | 56.5 | 78.8  | 38.5 | 61.1                              | 61.2 | 57.7 | 53.4 | 52.3  | 47.1  | 37.1  | 30.2  | 19.0   |
| 23:30 - 23:45                                           | 49.5 | 72.8  | 37.6 | 45.3                              | 41.8 | 41.4 | 42.1 | 47.0  | 43.1  | 32.4  | 25.5  | 15.3   |
| 23:45 - 00:00                                           | 55.5 | 75.2  | 35.9 | 51.8                              | 46.8 | 46.2 | 47.4 | 53.0  | 49.3  | 38.9  | 32.0  | 21.2   |
| 00:00 - 00:15                                           | 48.6 | 74.8  | 34.0 | 43.3                              | 41.6 | 42.0 | 41.5 | 45.9  | 42.1  | 30.4  | 23.4  | 15.2   |
| 00:15 - 00:30                                           | 53.6 | 75.8  | 35.5 | 50.8                              | 48.5 | 44.2 | 45.6 | 51.2  | 47.2  | 37.6  | 31.0  | 19.7   |
| 00:30 - 00:45                                           | 53.5 | 75.8  | 34.8 | 46.2                              | 43.1 | 44.1 | 45.0 | 51.0  | 47.3  | 36.4  | 29.2  | 18.0   |
| 00:45 - 01:00                                           | 49.1 | 74.8  | 33.3 | 50.4                              | 47.0 | 46.9 | 42.2 | 45.8  | 42.5  | 31.5  | 23.1  | 14.1   |
| 01:00 - 01:15                                           | 52.6 | 75.0  | 36.1 | 46.0                              | 42.6 | 43.8 | 44.5 | 50.2  | 46.3  | 34.9  | 26.9  | 17.4   |
| 01:15 - 01:30                                           | 49.8 | 72.4  | 33.5 | 42.8                              | 41.1 | 41.4 | 41.3 | 47.3  | 43.3  | 33.7  | 26.6  | 16.0   |
| 01:30 - 01:45                                           | 54.2 | 79.9  | 35.3 | 46.8                              | 44.9 | 45.7 | 46.7 | 51.9  | 47.5  | 38.1  | 31.7  | 20.7   |
| 01:45 - 02:00                                           | 33.7 | 43.7  | 31.1 | 38.5                              | 36.3 | 30.3 | 30.2 | 31.4  | 22.2  | 11.9  | 10.5  | 9.2    |
| 02:00 - 02:15                                           | 35.7 | 46.3  | 32.9 | 39.3                              | 38.3 | 32.3 | 33.4 | 33.1  | 22.3  | 11.8  | 10.7  | 9.2    |
| 02:15 - 02:30                                           | 46.6 | 71.1  | 31.8 | 47.9                              | 39.9 | 38.9 | 39.6 | 43.6  | 40.1  | 33.5  | 28.0  | 17.1   |
| 02:30 - 02:45                                           | 55.2 | 85.2  | 33.6 | 50.9                              | 49.6 | 49.5 | 48.4 | 52.3  | 48.9  | 40.4  | 32.4  | 19.7   |
| 02:45 - 03:00                                           | 50.4 | 73.6  | 33.2 | 47.4                              | 41.7 | 41.1 | 43.0 | 47.7  | 43.9  | 34.6  | 26.9  | 16.2   |
| 03:00 - 03:15                                           | 38.2 | 62.1  | 32.7 | 39.1                              | 36.1 | 32.5 | 35.8 | 35.8  | 26.1  | 16.9  | 11.8  | 9.3    |
| 03:15 - 03:30                                           | 38.0 | 46.5  | 34.6 | 39.4                              | 36.9 | 32.0 | 34.1 | 36.2  | 26.0  | 13.7  | 10.6  | 9.2    |
| 03:30 - 03:45                                           | 39.3 | 50.2  | 36.2 | 40.7                              | 37.7 | 33.5 | 35.9 | 37.3  | 27.7  | 17.2  | 12.3  | 9.2    |
| 03:45 - 04:00                                           | 48.0 | 74.2  | 35.5 | 45.6                              | 40.0 | 38.7 | 40.3 | 46.0  | 40.9  | 28.4  | 19.8  | 12.2   |
| 04:00 - 04:15                                           | 37.9 | 48.5  | 35.2 | 40.6                              | 37.5 | 33.6 | 34.3 | 35.6  | 26.6  | 21.5  | 15.4  | 9.3    |
| 04:15 - 04:30                                           | 53.0 | 75.7  | 38.8 | 50.8                              | 48.5 | 47.4 | 47.8 | 48.5  | 46.6  | 43.1  | 37.7  | 21.9   |
| 04:30 - 04:45                                           | 58.1 | 80.8  | 43.1 | 57.5                              | 50.8 | 51.1 | 52.3 | 54.6  | 51.4  | 46.9  | 41.1  | 26.6   |
| 04:45 - 05:00                                           | 51.7 | 75.6  | 42.3 | 46.4                              | 42.6 | 42.6 | 43.7 | 49.3  | 45.3  | 34.5  | 24.0  | 12.7   |
| 05:00 - 05:15                                           | 55.7 | 77.0  | 42.8 | 51.6                              | 46.3 | 46.8 | 48.5 | 53.4  | 48.4  | 40.7  | 34.9  | 23.3   |
| 05:15 - 05:30                                           | 55.8 | 76.4  | 41.9 | 57.0                              | 49.6 | 48.0 | 48.6 | 53.1  | 48.9  | 42.6  | 36.0  | 24.2   |
| 05:30 - 05:45                                           | 59.7 | 79.2  | 44.7 | 55.7                              | 59.5 | 58.8 | 54.5 | 56.4  | 51.9  | 43.3  | 36.5  | 23.9   |
| 05:45 - 06:00                                           | 58.7 | 79.7  | 45.6 | 54.1                              | 48.7 | 49.6 | 50.7 | 56.5  | 52.0  | 41.2  | 33.4  | 21.8   |
| 06:00 - 06:15                                           | 60.3 | 76.7  | 47.8 | 59.3                              | 53.5 | 52.5 | 53.9 | 57.8  | 53.2  | 44.0  | 36.8  | 25.4   |
| 06:15 - 06:30                                           | 63.2 | 80.3  | 50.1 | 61.6                              | 57.0 | 57.1 | 57.4 | 60.3  | 56.5  | 47.6  | 39.4  | 29.1   |
| 06:30 - 06:45                                           | 71.2 | 98.6  | 55.4 | 68.1                              | 66.1 | 71.3 | 71.4 | 64.9  | 60.2  | 53.8  | 45.4  | 34.1   |
| 06:45 - 07:00                                           | 65.6 | 82.2  | 55.3 | 67.0                              | 58.5 | 57.3 | 58.0 | 63.1  | 58.9  | 49.8  | 42.8  | 30.2   |



## 18 APPENDIX B - L<sub>A</sub>max 1 MINUTE DATA

### 18.1.1 World Health Organisations 'Guidelines For Community Noise'.

The WHO Guideline for Community Noise suggests that levels of L<sub>A</sub>F<sub>max</sub> 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 this criteria to ascertain if the proposed glazing and ventilation specification will be suitable to achieve that of the assessed 11<sup>th</sup> highest recorded L<sub>A</sub>F<sub>max</sub> dB level.

## 18.2 Results

Therefore, the following tabulated results from the worst night have been calculated and demonstrate compliance with the requirements of PRoPG. The following 1 minute data is detailed below together with the number above or below the L<sub>A</sub>max 80 & 85 dB threshold.

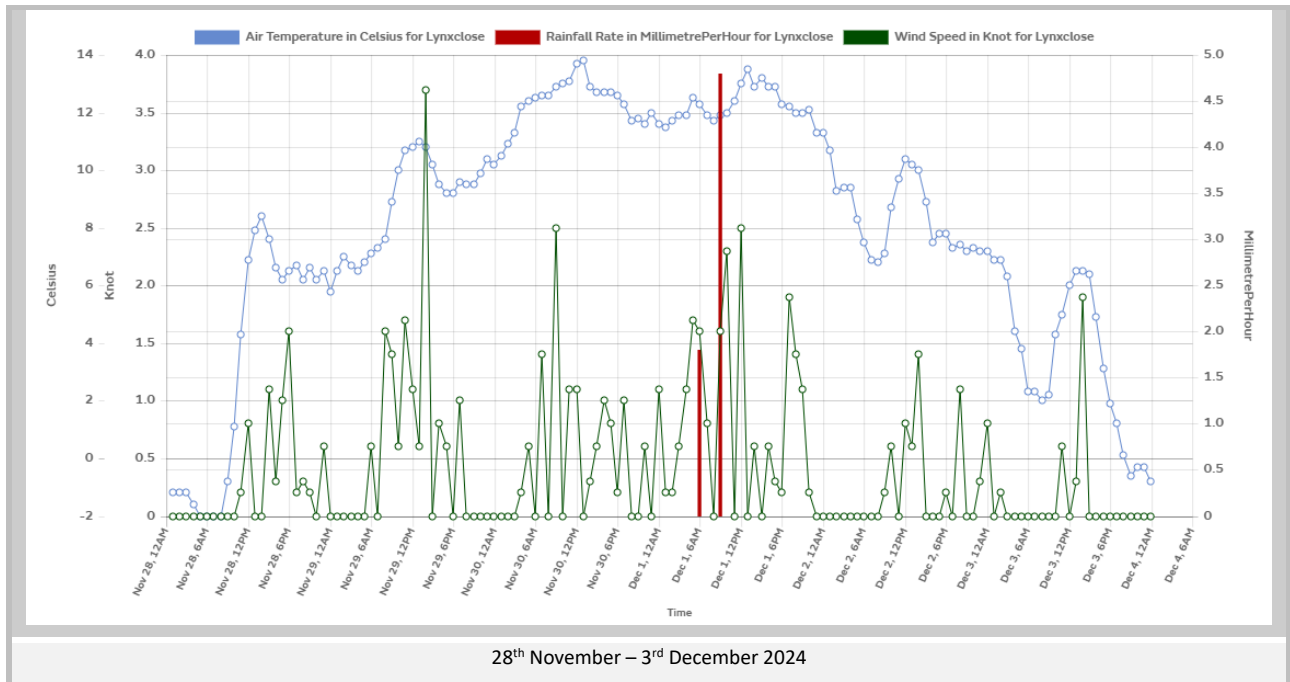
### 18.2.1 Professional Practice Guidance on Planning & Noise.

| L <sub>A</sub> F <sub>max</sub> dB | 79.7  | 80.0  | 80.1  | 79.1  | 74.9  | L <sub>A</sub> F <sub>max</sub> dB | 79.7  | 80.0  | 80.1  | 79.1  | 74.9  | L <sub>A</sub> F <sub>max</sub> dB | 79.7  | 80.0  | 80.1  | 79.1  | 74.9  |
|------------------------------------|-------|-------|-------|-------|-------|------------------------------------|-------|-------|-------|-------|-------|------------------------------------|-------|-------|-------|-------|-------|
| Time                               | Fig 1 | Fig 2 | Fig 3 | Fig 4 | Fig 5 | Time                               | Fig 1 | Fig 2 | Fig 3 | Fig 4 | Fig 5 | Time                               | Fig 1 | Fig 2 | Fig 3 | Fig 4 | Fig 5 |
| 23:00:59                           | 75.6  | 48.1  | 73.2  | 46.3  | 43.5  | 23:49:59                           | 51.4  | 50.2  | 43.0  | 40.9  | 74.5  | 00:38:59                           | 41.8  | 45.1  | 76.3  | 38.9  | 41.8  |
| 23:01:59                           | 51.8  | 75.8  | 73.6  | 52.9  | 44.0  | 23:50:59                           | 50.2  | 74.8  | 48.0  | 67.1  | 43.4  | 00:39:59                           | 40.9  | 42.8  | 77.6  | 38.8  | 45.9  |
| 23:02:59                           | 52.8  | 54.5  | 74.3  | 41.2  | 48.7  | 23:51:59                           | 45.0  | 56.2  | 51.8  | 55.7  | 73.7  | 00:40:59                           | 46.1  | 42.6  | 53.0  | 38.6  | 46.8  |
| 23:03:59                           | 52.0  | 70.6  | 47.6  | 39.1  | 67.4  | 23:52:59                           | 44.1  | 73.0  | 74.6  | 40.2  | 40.5  | 00:41:59                           | 40.5  | 42.8  | 43.3  | 39.1  | 50.2  |
| 23:04:59                           | 49.9  | 50.1  | 65.6  | 39.7  | 73.9  | 23:53:59                           | 41.5  | 71.0  | 69.1  | 39.4  | 44.7  | 00:42:59                           | 73.3  | 43.6  | 54.5  | 45.7  | 45.2  |
| 23:05:59                           | 72.0  | 75.5  | 72.7  | 40.8  | 51.2  | 23:54:59                           | 46.6  | 71.1  | 70.2  | 69.9  | 72.1  | 00:43:59                           | 50.2  | 42.2  | 70.6  | 43.3  | 46.4  |
| 23:06:59                           | 64.1  | 67.9  | 47.9  | 47.3  | 74.4  | 23:55:59                           | 64.6  | 72.6  | 50.6  | 59.9  | 70.0  | 00:44:59                           | 47.9  | 43.4  | 54.2  | 44.5  | 44.3  |
| 23:07:59                           | 64.2  | 63.3  | 49.7  | 43.9  | 61.7  | 23:56:59                           | 72.9  | 46.0  | 47.2  | 40.4  | 75.2  | 00:45:59                           | 47.5  | 42.1  | 67.9  | 69.7  | 37.8  |
| 23:08:59                           | 50.2  | 70.5  | 71.9  | 68.1  | 67.1  | 23:57:59                           | 77.1  | 52.1  | 42.8  | 41.8  | 45.2  | 00:46:59                           | 68.3  | 75.3  | 67.1  | 39.4  | 39.5  |
| 23:09:59                           | 47.7  | 70.0  | 72.0  | 76.2  | 45.5  | 23:58:59                           | 43.4  | 72.7  | 55.0  | 41.0  | 40.2  | 00:47:59                           | 42.6  | 42.1  | 71.0  | 40.0  | 43.9  |
| 23:10:59                           | 46.3  | 73.3  | 70.3  | 43.2  | 70.2  | 23:59:59                           | 38.8  | 60.9  | 72.7  | 45.3  | 40.5  | 00:48:59                           | 40.7  | 42.9  | 50.0  | 37.6  | 42.9  |
| 23:11:59                           | 67.5  | 63.1  | 72.0  | 43.2  | 74.5  | 00:00:59                           | 49.0  | 45.5  | 69.4  | 42.9  | 40.3  | 00:49:59                           | 72.7  | 45.3  | 69.3  | 37.3  | 37.4  |
| 23:12:59                           | 56.3  | 42.6  | 73.2  | 42.0  | 70.6  | 00:01:59                           | 46.4  | 48.3  | 43.4  | 50.9  | 40.5  | 00:50:59                           | 47.0  | 73.4  | 55.5  | 37.6  | 41.8  |
| 23:13:59                           | 77.8  | 74.5  | 68.8  | 48.0  | 72.1  | 00:02:59                           | 73.3  | 73.4  | 49.1  | 74.7  | 41.6  | 00:51:59                           | 52.6  | 41.7  | 51.1  | 45.4  | 63.0  |
| 23:14:59                           | 47.6  | 72.5  | 69.2  | 72.0  | 45.9  | 00:03:59                           | 44.0  | 45.6  | 52.8  | 39.7  | 44.3  | 00:52:59                           | 56.4  | 39.3  | 47.9  | 39.4  | 38.9  |
| 23:15:59                           | 48.0  | 42.7  | 64.4  | 41.5  | 44.9  | 00:04:59                           | 49.6  | 68.7  | 76.8  | 74.2  | 38.4  | 00:53:59                           | 51.3  | 38.2  | 39.9  | 49.0  | 39.7  |
| 23:16:59                           | 45.6  | 44.7  | 71.4  | 42.7  | 45.9  | 00:05:59                           | 44.7  | 62.3  | 66.5  | 54.6  | 41.2  | 00:54:59                           | 37.7  | 41.2  | 43.5  | 43.6  | 37.8  |
| 23:17:59                           | 74.7  | 44.4  | 72.7  | 40.9  | 72.0  | 00:06:59                           | 45.8  | 47.1  | 68.1  | 72.0  | 40.7  | 00:55:59                           | 38.4  | 40.5  | 71.5  | 65.2  | 40.2  |
| 23:18:59                           | 72.6  | 53.8  | 76.8  | 61.3  | 45.9  | 00:07:59                           | 44.7  | 46.1  | 69.7  | 71.5  | 43.1  | 00:56:59                           | 38.9  | 43.2  | 53.3  | 39.3  | 44.4  |
| 23:19:59                           | 51.2  | 80.9  | 70.3  | 62.5  | 43.3  | 00:08:59                           | 50.7  | 69.5  | 67.9  | 54.3  | 42.1  | 00:57:59                           | 77.6  | 74.2  | 74.5  | 40.1  | 47.4  |
| 23:20:59                           | 41.9  | 55.0  | 79.0  | 42.4  | 42.2  | 00:09:59                           | 73.7  | 65.4  | 44.9  | 46.5  | 39.1  | 00:58:59                           | 58.8  | 39.2  | 41.1  | 39.7  | 41.7  |
| 23:21:59                           | 51.8  | 82.2  | 69.0  | 39.1  | 72.8  | 00:10:59                           | 63.3  | 47.6  | 70.5  | 40.3  | 74.8  | 00:59:59                           | 47.0  | 72.1  | 44.8  | 40.0  | 74.8  |
| 23:22:59                           | 74.3  | 69.4  | 50.1  | 47.1  | 58.5  | 00:11:59                           | 44.1  | 48.9  | 72.3  | 40.5  | 37.9  | 01:00:59                           | 53.0  | 78.3  | 65.3  | 65.0  | 40.2  |
| 23:23:59                           | 74.1  | 45.1  | 60.4  | 51.1  | 48.6  | 00:12:59                           | 48.0  | 47.1  | 66.3  | 41.7  | 46.9  | 01:01:59                           | 46.3  | 41.5  | 44.1  | 39.7  | 42.8  |
| 23:24:59                           | 53.0  | 69.4  | 72.7  | 94.2  | 78.8  | 00:13:59                           | 70.7  | 47.8  | 71.0  | 40.9  | 41.0  | 01:02:59                           | 43.2  | 44.5  | 44.2  | 76.3  | 48.6  |
| 23:25:59                           | 51.9  | 73.0  | 71.7  | 43.1  | 47.4  | 00:14:59                           | 69.9  | 70.3  | 67.9  | 45.2  | 42.5  | 01:03:59                           | 40.7  | 43.3  | 41.8  | 38.1  | 46.7  |
| 23:26:59                           | 72.0  | 67.6  | 45.7  | 44.8  | 69.7  | 00:15:59                           | 46.0  | 77.1  | 44.7  | 45.2  | 36.6  | 01:04:59                           | 45.3  | 41.0  | 66.7  | 37.2  | 49.4  |
| 23:27:59                           | 48.7  | 70.7  | 71.8  | 41.5  | 39.4  | 00:16:59                           | 50.1  | 73.9  | 72.2  | 43.2  | 42.8  | 01:05:59                           | 42.2  | 72.0  | 43.5  | 49.5  | 39.5  |
| 23:28:59                           | 74.5  | 65.4  | 63.7  | 40.8  | 73.3  | 00:17:59                           | 72.3  | 49.7  | 46.8  | 65.5  | 46.2  | 01:06:59                           | 71.0  | 43.2  | 46.1  | 75.3  | 47.4  |
| 23:29:59                           | 59.7  | 57.2  | 77.0  | 39.2  | 42.5  | 00:18:59                           | 56.3  | 58.9  | 46.0  | 72.7  | 71.7  | 01:07:59                           | 53.0  | 41.6  | 44.9  | 37.8  | 47.2  |
| 23:30:59                           | 47.9  | 45.7  | 55.2  | 43.1  | 42.6  | 00:19:59                           | 49.3  | 72.4  | 43.6  | 57.5  | 75.8  | 01:08:59                           | 40.9  | 43.6  | 41.3  | 38.2  | 48.0  |
| 23:31:59                           | 45.7  | 46.5  | 47.2  | 43.8  | 46.3  | 00:20:59                           | 51.5  | 46.3  | 47.3  | 38.4  | 58.7  | 01:09:59                           | 52.4  | 44.0  | 47.5  | 54.9  | 45.6  |
| 23:32:59                           | 47.6  | 74.8  | 50.6  | 39.7  | 47.9  | 00:21:59                           | 46.7  | 54.5  | 65.1  | 41.3  | 73.0  | 01:10:59                           | 48.4  | 42.3  | 42.7  | 48.2  | 47.1  |
| 23:33:59                           | 71.0  | 52.6  | 74.5  | 42.6  | 66.9  | 00:22:59                           | 42.0  | 66.4  | 50.8  | 40.2  | 44.8  | 01:11:59                           | 71.4  | 45.4  | 46.5  | 35.0  | 46.3  |
| 23:34:59                           | 51.1  | 49.2  | 48.5  | 65.9  | 50.3  | 00:23:59                           | 41.8  | 46.3  | 49.7  | 50.7  | 57.9  | 01:12:59                           | 46.7  | 40.0  | 48.9  | 37.1  | 74.9  |
| 23:35:59                           | 56.8  | 46.2  | 73.7  | 39.7  | 48.0  | 00:24:59                           | 47.2  | 45.9  | 47.8  | 72.3  | 71.0  | 01:13:59                           | 40.9  | 41.4  | 46.7  | 37.1  | 75.0  |
| 23:36:59                           | 51.8  | 45.2  | 43.7  | 47.2  | 43.3  | 00:25:59                           | 72.3  | 42.2  | 48.6  | 43.1  | 40.3  | 01:14:59                           | 54.3  | 63.8  | 68.8  | 37.7  | 58.0  |
| 23:37:59                           | 82.0  | 75.6  | 46.8  | 45.1  | 40.0  | 00:26:59                           | 44.3  | 46.2  | 71.2  | 39.8  | 40.1  | 01:15:59                           | 38.1  | 63.3  | 45.1  | 37.4  | 44.7  |
| 23:38:59                           | 55.0  | 70.8  | 51.6  | 70.9  | 47.2  | 00:27:59                           | 64.9  | 71.1  | 48.2  | 40.7  | 39.9  | 01:16:59                           | 44.0  | 42.3  | 47.5  | 39.1  | 39.5  |
| 23:39:59                           | 47.7  | 74.4  | 47.3  | 41.7  | 44.6  | 00:28:59                           | 45.1  | 43.1  | 45.1  | 44.6  | 40.8  | 01:17:59                           | 47.2  | 69.2  | 70.9  | 40.8  | 44.1  |
| 23:40:59                           | 49.5  | 44.8  | 51.4  | 40.5  | 72.8  | 00:29:59                           | 38.4  | 73.5  | 47.2  | 61.9  | 42.1  | 01:18:59                           | 40.9  | 64.5  | 49.1  | 38.9  | 70.6  |
| 23:41:59                           | 48.2  | 44.1  | 54.2  | 43.1  | 45.3  | 00:30:59                           | 47.4  | 86.5  | 71.1  | 53.3  | 65.8  | 01:19:59                           | 43.0  | 42.0  | 40.9  | 39.4  | 42.5  |
| 23:42:59                           | 53.1  | 61.8  | 71.4  | 45.5  | 40.3  | 00:31:59                           | 61.9  | 47.7  | 52.3  | 43.0  | 44.5  | 01:20:59                           | 65.8  | 44.5  | 44.2  | 38.5  | 42.9  |
| 23:43:59                           | 43.2  | 71.2  | 71.7  | 66.9  | 41.6  | 00:32:59                           | 45.9  | 44.5  | 49.4  | 57.2  | 75.8  | 01:21:59                           | 61.8  | 42.6  | 43.3  | 38.5  | 45.7  |
| 23:44:59                           | 45.6  | 45.6  | 69.1  | 74.8  | 41.3  | 00:33:59                           | 46.6  | 49.2  | 45.0  | 46.0  | 52.0  | 01:22:59                           | 44.2  | 40.9  | 46.3  | 38.8  | 46.2  |
| 23:45:59                           | 51.6  | 79.9  | 47.5  | 80.1  | 41.5  | 00:34:59                           | 53.6  | 47.0  | 43.0  | 50.7  | 46.8  | 01:23:59                           | 46.0  | 41.3  | 41.9  | 39.3  | 72.4  |

|           |       |       |       |       |       |           |       |       |       |       |       |           |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-----------|-------|-------|-------|-------|-------|-----------|-------|-------|-------|-------|-------|
| 23:46:59  | 64.4  | 46.5  | 47.5  | 60.0  | 43.3  | 00:35:59  | 46.0  | 72.9  | 44.1  | 46.5  | 38.7  | 01:24:59  | 53.5  | 43.8  | 65.6  | 39.7  | 55.5  |
| 23:47:59  | 53.8  | 44.8  | 51.2  | 46.3  | 69.6  | 00:36:59  | 44.3  | 41.2  | 44.1  | 58.1  | 43.7  | 01:25:59  | 39.7  | 44.1  | 46.6  | 39.9  | 40.0  |
| 23:48:59  | 52.6  | 45.6  | 68.2  | 37.3  | 43.9  | 00:37:59  | 44.6  | 42.9  | 44.6  | 44.3  | 43.0  | 01:26:59  | 46.7  | 42.6  | 67.4  | 40.6  | 39.3  |
| LaFmax dB | ##    | 86.5  | ##    | ##    | ##    | LaFmax dB | ##    | 86.5  | ##    | ##    | ##    | LaFmax dB | ##    | 86.5  | ##    | ##    | ##    |
| Time      | Fig 1 | Fig 2 | Fig 3 | Fig 4 | Fig 5 | Time      | Fig 1 | Fig 2 | Fig 3 | Fig 4 | Fig 5 | Time      | Fig 1 | Fig 2 | Fig 3 | Fig 4 | Fig 5 |
| 01:27:59  | 41.6  | 46.4  | 65.1  | 42.0  | 42.6  | 02:38:59  | 40.4  | 77.2  | 39.6  | 39.0  | 40.0  | 03:49:59  | 59.7  | 39.8  | 52.8  | 51.5  | 49.1  |
| 01:28:59  | 49.6  | 42.8  | 48.4  | 38.1  | 39.0  | 02:39:59  | 47.0  | 40.7  | 43.4  | 40.9  | 48.2  | 03:50:59  | 67.8  | 45.9  | 38.2  | 40.6  | 43.6  |
| 01:29:59  | 46.5  | 39.2  | 57.2  | 40.6  | 42.5  | 02:40:59  | 35.8  | 66.9  | 36.5  | 38.5  | 85.2  | 03:51:59  | 53.5  | 67.3  | 45.7  | 42.6  | 36.6  |
| 01:30:59  | 44.2  | 45.6  | 63.8  | 71.9  | 41.4  | 02:41:59  | 43.9  | 39.5  | 45.7  | 74.5  | 43.5  | 03:52:59  | 44.0  | 74.1  | 44.3  | 42.2  | 37.2  |
| 01:31:59  | 46.9  | 44.9  | 58.5  | 39.2  | 43.2  | 02:42:59  | 72.8  | 38.9  | 43.0  | 50.9  | 38.7  | 03:53:59  | 48.4  | 53.6  | 46.6  | 44.0  | 40.6  |
| 01:32:59  | 47.8  | 66.5  | 42.2  | 39.4  | 39.5  | 02:43:59  | 45.6  | 37.7  | 67.6  | 72.1  | 39.3  | 03:54:59  | 43.1  | 37.6  | 44.2  | 44.3  | 44.9  |
| 01:33:59  | 40.7  | 65.2  | 72.5  | 37.9  | 74.8  | 02:44:59  | 43.7  | 41.5  | 46.5  | 41.2  | 39.6  | 03:55:59  | 42.8  | 39.3  | 44.4  | 44.6  | 61.5  |
| 01:34:59  | 42.8  | 62.3  | 45.8  | 73.1  | 41.2  | 02:45:59  | 38.6  | 50.0  | 39.4  | 41.1  | 38.7  | 03:56:59  | 41.0  | 36.7  | 44.6  | 46.3  | 74.2  |
| 01:35:59  | 43.7  | 42.1  | 43.2  | 41.5  | 65.5  | 02:46:59  | 41.3  | 75.8  | 35.2  | 39.6  | 41.0  | 03:57:59  | 41.1  | 35.4  | 38.9  | 77.6  | 51.8  |
| 01:36:59  | 38.1  | 38.3  | 56.0  | 39.9  | 79.9  | 02:47:59  | 37.3  | 42.1  | 39.6  | 38.5  | 42.5  | 03:58:59  | 64.6  | 38.3  | 41.5  | 48.0  | 49.1  |
| 01:37:59  | 35.8  | 41.3  | 45.7  | 36.8  | 43.4  | 02:48:59  | 70.0  | 72.0  | 61.3  | 37.9  | 72.1  | 03:59:59  | 44.5  | 36.3  | 39.0  | 46.2  | 50.8  |
| 01:38:59  | 42.9  | 38.4  | 40.2  | 36.8  | 70.2  | 02:49:59  | 55.2  | 72.8  | 67.1  | 39.3  | 44.2  | 04:00:59  | 39.8  | 41.4  | 41.6  | 43.9  | 42.5  |
| 01:39:59  | 44.3  | 43.6  | 71.7  | 41.2  | 56.2  | 02:50:59  | 46.9  | 40.3  | 43.9  | 37.6  | 39.1  | 04:01:59  | 42.6  | 36.4  | 42.4  | 45.0  | 42.7  |
| 01:40:59  | 37.1  | 42.3  | 71.9  | 37.7  | 39.6  | 02:51:59  | 44.6  | 66.4  | 69.6  | 45.3  | 73.6  | 04:02:59  | 44.5  | 36.2  | 40.9  | 44.8  | 41.7  |
| 01:41:59  | 36.2  | 45.5  | 44.4  | 35.3  | 47.0  | 02:52:59  | 41.1  | 65.8  | 43.7  | 43.8  | 43.2  | 04:03:59  | 40.3  | 35.7  | 41.2  | 42.3  | 42.7  |
| 01:42:59  | 54.1  | 43.5  | 78.6  | 37.9  | 39.4  | 02:53:59  | 41.6  | 40.9  | 46.2  | 45.3  | 37.8  | 04:04:59  | 47.2  | 38.4  | 43.7  | 40.4  | 46.5  |
| 01:43:59  | 45.7  | 72.4  | 53.1  | 37.1  | 41.6  | 02:54:59  | 44.2  | 38.0  | 36.0  | 40.9  | 39.4  | 04:05:59  | 48.9  | 70.2  | 48.0  | 43.2  | 43.6  |
| 01:44:59  | 38.9  | 47.8  | 65.5  | 38.2  | 38.0  | 02:55:59  | 43.7  | 68.9  | 39.4  | 42.3  | 44.4  | 04:06:59  | 40.0  | 40.5  | 72.6  | 42.3  | 44.8  |
| 01:45:59  | 69.7  | 37.1  | 64.5  | 44.4  | 38.7  | 02:56:59  | 38.9  | 40.0  | 73.1  | 39.8  | 41.7  | 04:07:59  | 44.4  | 47.3  | 57.6  | 46.7  | 47.1  |
| 01:46:59  | 45.9  | 39.9  | 44.1  | 69.4  | 41.3  | 02:57:59  | 40.6  | 39.0  | 39.8  | 40.9  | 41.3  | 04:08:59  | 38.2  | 35.1  | 36.6  | 43.5  | 41.4  |
| 01:47:59  | 38.6  | 42.7  | 44.2  | 38.5  | 37.0  | 02:58:59  | 48.1  | 41.0  | 52.1  | 44.0  | 40.8  | 04:09:59  | 38.8  | 38.9  | 41.1  | 43.1  | 48.5  |
| 01:48:59  | 38.2  | 46.4  | 40.5  | 35.3  | 37.5  | 02:59:59  | 42.4  | 41.7  | 51.4  | 39.7  | 42.1  | 04:10:59  | 48.8  | 35.1  | 41.6  | 44.1  | 40.0  |
| 01:49:59  | 37.4  | 40.0  | 44.3  | 35.1  | 37.6  | 03:00:59  | 69.3  | 40.5  | 72.6  | 38.2  | 42.0  | 04:11:59  | 50.1  | 37.4  | 47.3  | 45.0  | 39.7  |
| 01:50:59  | 41.5  | 41.8  | 39.6  | 37.9  | 37.0  | 03:01:59  | 43.6  | 37.9  | 55.8  | 38.6  | 42.2  | 04:12:59  | 50.6  | 38.8  | 41.2  | 61.3  | 43.1  |
| 01:51:59  | 38.4  | 36.2  | 40.8  | 38.0  | 39.1  | 03:02:59  | 39.9  | 40.5  | 35.1  | 40.1  | 44.0  | 04:13:59  | 49.0  | 38.8  | 47.8  | 50.2  | 47.4  |
| 01:52:59  | 37.9  | 37.8  | 35.7  | 38.8  | 38.6  | 03:03:59  | 38.5  | 43.0  | 34.8  | 42.0  | 47.9  | 04:14:59  | 49.8  | 34.8  | 60.3  | 45.7  | 45.0  |
| 01:53:59  | 45.6  | 42.9  | 39.4  | 34.9  | 43.7  | 03:04:59  | 40.1  | 42.2  | 44.2  | 41.2  | 62.1  | 04:15:59  | 46.6  | 40.4  | 61.1  | 48.5  | 44.8  |
| 01:54:59  | 39.3  | 43.1  | 36.1  | 38.6  | 39.1  | 03:05:59  | 36.8  | 37.2  | 50.2  | 42.3  | 45.0  | 04:16:59  | 47.0  | 36.3  | 62.9  | 47.7  | 41.8  |
| 01:55:59  | 51.6  | 41.9  | 44.7  | 39.0  | 40.1  | 03:06:59  | 38.0  | 33.8  | 42.1  | 42.8  | 37.0  | 04:17:59  | 46.7  | 38.6  | 43.0  | 46.7  | 47.0  |
| 01:56:59  | 72.2  | 43.1  | 37.6  | 36.5  | 41.8  | 03:07:59  | 37.6  | 35.2  | 41.4  | 39.6  | 41.5  | 04:18:59  | 47.6  | 38.3  | 43.9  | 48.2  | 44.0  |
| 01:57:59  | 39.3  | 41.7  | 69.6  | 45.9  | 40.7  | 03:08:59  | 41.8  | 43.5  | 38.1  | 41.2  | 38.7  | 04:19:59  | 47.4  | 43.2  | 49.9  | 47.2  | 46.6  |
| 01:58:59  | 38.8  | 38.3  | 46.7  | 34.8  | 36.7  | 03:09:59  | 41.6  | 37.8  | 39.3  | 40.1  | 39.7  | 04:20:59  | 48.7  | 38.7  | 39.8  | 45.7  | 43.6  |
| 01:59:59  | 65.3  | 37.8  | 40.1  | 38.0  | 35.5  | 03:10:59  | 73.6  | 40.0  | 35.7  | 40.3  | 38.4  | 04:21:59  | 46.4  | 35.9  | 40.7  | 46.6  | 47.9  |
| 02:00:59  | 45.7  | 40.0  | 45.9  | 40.0  | 40.6  | 03:11:59  | 37.3  | 42.7  | 70.5  | 40.3  | 43.2  | 04:22:59  | 46.5  | 37.4  | 39.6  | 68.4  | 45.8  |
| 02:01:59  | 37.7  | 42.7  | 67.7  | 41.2  | 45.6  | 03:12:59  | 37.2  | 39.4  | 44.1  | 40.3  | 46.2  | 04:23:59  | 47.4  | 37.7  | 36.0  | 73.1  | 75.1  |
| 02:02:59  | 36.8  | 38.3  | 44.1  | 41.6  | 40.6  | 03:13:59  | 47.3  | 37.9  | 42.1  | 43.1  | 40.5  | 04:24:59  | 45.6  | 38.1  | 38.5  | 44.8  | 49.0  |
| 02:03:59  | 38.9  | 38.3  | 41.6  | 39.7  | 40.4  | 03:14:59  | 42.9  | 37.4  | 36.0  | 39.3  | 42.6  | 04:25:59  | 45.0  | 36.8  | 42.4  | 43.9  | 46.6  |
| 02:04:59  | 47.3  | 37.5  | 50.7  | 42.1  | 39.7  | 03:15:59  | 43.6  | 37.5  | 34.2  | 53.8  | 42.2  | 04:26:59  | 45.3  | 39.4  | 46.2  | 45.0  | 49.6  |
| 02:05:59  | 53.1  | 38.2  | 73.4  | 39.4  | 40.3  | 03:16:59  | 34.5  | 38.5  | 41.6  | 38.0  | 41.7  | 04:27:59  | 47.3  | 39.0  | 45.1  | 42.2  | 65.9  |
| 02:06:59  | 68.1  | 41.9  | 63.6  | 42.4  | 46.3  | 03:17:59  | 37.9  | 39.6  | 47.1  | 40.8  | 46.5  | 04:28:59  | 47.3  | 37.5  | 61.3  | 44.2  | 65.1  |
| 02:07:59  | 41.6  | 38.9  | 70.0  | 40.7  | 42.1  | 03:18:59  | 35.6  | 37.2  | 38.7  | 42.7  | 43.5  | 04:29:59  | 45.6  | 38.0  | 38.4  | 43.8  | 75.7  |
| 02:08:59  | 41.9  | 39.7  | 39.4  | 39.1  | 36.8  | 03:19:59  | 37.9  | 38.0  | 36.0  | 42.7  | 41.4  | 04:30:59  | 46.3  | 36.9  | 42.2  | 77.2  | 69.7  |
| 02:09:59  | 47.7  | 38.4  | 37.7  | 38.5  | 44.1  | 03:20:59  | 36.8  | 39.2  | 64.2  | 42.5  | 46.0  | 04:31:59  | 77.7  | 38.9  | 38.7  | 42.9  | 66.4  |
| 02:10:59  | 49.4  | 39.2  | 43.3  | 38.4  | 38.5  | 03:21:59  | 36.6  | 36.8  | 34.4  | 41.8  | 41.6  | 04:32:59  | 45.9  | 36.8  | 44.6  | 45.4  | 59.5  |
| 02:11:59  | 47.0  | 41.0  | 35.5  | 39.0  | 34.7  | 03:22:59  | 50.4  | 35.7  | 34.1  | 41.9  | 41.4  | 04:33:59  | 47.0  | 39.9  | 43.1  | 45.0  | 47.8  |
| 02:12:59  | 40.4  | 38.2  | 49.2  | 39.0  | 38.1  | 03:23:59  | 47.2  | 38.0  | 39.2  | 45.6  | 45.3  | 04:34:59  | 45.2  | 37.8  | 44.0  | 45.5  | 48.4  |
| 02:13:59  | 44.5  | 55.1  | 40.5  | 38.3  | 42.9  | 03:24:59  | 41.7  | 39.7  | 69.9  | 39.0  | 45.3  | 04:35:59  | 58.7  | 39.7  | 42.5  | 72.1  | 49.9  |
| 02:14:59  | 54.5  | 69.7  | 43.9  | 39.2  | 42.5  | 03:25:59  | 39.0  | 36.8  | 53.6  | 43.3  | 44.0  | 04:36:59  | 71.3  | 72.4  | 43.7  | 46.3  | 49.0  |
| 02:15:59  | 39.8  | 38.3  | 44.0  | 38.3  | 39.0  | 03:26:59  | 45.6  | 39.6  | 43.1  | 40.8  | 42.4  | 04:37:59  | 49.6  | 38.6  | 45.2  | 46.9  | 71.8  |
| 02:16:59  | 44.6  | 36.2  | 44.2  | 39.4  | 38.7  | 03:27:59  | 41.0  | 38.7  | 36.2  | 42.5  | 43.0  | 04:38:59  | 46.7  | 48.6  | 42.8  | 62.9  | 49.6  |
| 02:17:59  | 45.9  | 36.6  | 36.8  | 41.9  | 38.8  | 03:28:59  | 38.7  | 40.2  | 41.6  | 40.3  | 41.5  | 04:39:59  | 48.1  | 45.9  | 45.6  | 81.7  | 47.9  |
| 02:18:59  | 43.9  | 39.0  | 44.6  | 38.2  | 42.8  | 03:29:59  | 65.4  | 38.2  | 35.7  | 40.5  | 46.0  | 04:40:59  | 51.9  | 45.8  | 80.0  | 61.6  | 56.0  |
| 02:19:59  | 44.0  | 38.7  | 41.9  | 38.7  | 40.4  | 03:30:59  | 74.8  | 40.0  | 37.6  | 41.0  | 44.4  | 04:41:59  | 42.5  | 48.0  | 43.3  | 63.7  | 76.8  |
| 02:20:59  | 45.9  | 44.8  | 40.3  | 39.8  | 39.3  | 03:31:59  | 54.2  | 38.0  | 39.2  | 40.6  | 48.3  | 04:42:59  | 45.8  | 39.8  | 43.8  | 66.0  | 57.8  |
| 02:21:59  | 39.0  | 40.5  | 45.9  | 39.8  | 35.6  | 03:32:59  | 38.4  | 39.2  | 47.1  | 42.8  | 45.5  | 04:43:59  | 49.1  | 38.0  | 44.8  | 64.9  | 51.3  |
| 02:22:59  | 49.6  | 45.8  | 48.4  | 40.2  | 39.0  | 03:33:59  | 48.0  | 37.4  | 35.2  | 45.7  | 50.2  | 04:44:59  | 43.5  | 41.4  | 44.1  | 46.3  | 80.8  |
| 02:23:59  | 39.1  | 41.9  | 43.7  | 41.2  | 42.2  | 03:34:59  | 46.0  | 39.5  | 46.8  | 43.1  | 44.0  | 04:45:59  | 46.2  | 44.3  | 43.6  | 47.7  | 51.8  |
| 02:24:59  | 38.5  | 37.0  | 35.0  | 69.4  | 38.1  | 03:35:59  | 40.6  | 38.9  | 64.4  | 40.5  | 44.3  | 04:46:59  | 42.2  | 47.5  | 44.3  | 47.8  | 52.2  |
| 02:25:59  | 39.4  | 43.7  | 37.3  | 64.9  | 71.1  | 03:36:59  | 53.0  | 38.0  | 39.9  | 40.6  | 45.7  | 04:47:59  | 40.0  | 73.0  | 41.7  | 72.6  | 49.9  |
| 02:26:59  | 40.6  | 37.9  | 48.5  | 40.2  | 47.0  | 03:37:59  | 41.5  | 37.1  | 43.5  | 41.5  | 45.5  | 04:48:59  | 43.2  | 69.0  | 44.1  | 46.9  | 61.3  |
| 02:27:59  | 47.1  | 37.9  | 40.8  | 42.6  | 36.6  | 03:38:59  | 36.3  | 68.7  | 34.7  | 43.1  | 45.8  | 04:49:59  | 44.8  | 44.5  | 42.6  | 45.7  | 66.0  |
| 02:28:59  | 42.2  | 37.1  | 36.8  | 39.2  | 37.0  | 03:39:59  | 39.7  | 47.9  | 40.6  | 46.2  | 42.5  | 04:50:59  | 45.6  | 47.7  | 46.7  | 76.8  | 47.8  |
| 02:29:59  | 38.8  | 36.4  | 44.2  | 39.6  | 37.9  | 03:40:59  | 42.2  | 37.9  | 52.3  | 42.2  | 41.0  | 04:51:59  | 41.6  | 50.7  | 45.0  | 71.8  | 49.2  |
| 02:30:59  | 39.0  | 39.7  | 38.8  | 38.4  | 70.4  | 03:41:59  | 38.8  | 40.2  | 70.2  | 44.4  | 40.5  | 04:52:59  | 41.0  | 51.8  | 44.1  |       |       |

|           |       |       |       |       |       |           |       |       |       |       |       |           |       |       |       |       |       |
|-----------|-------|-------|-------|-------|-------|-----------|-------|-------|-------|-------|-------|-----------|-------|-------|-------|-------|-------|
| 02:35:59  | 40.0  | 38.6  | 38.5  | 67.4  | 47.0  | 03:46:59  | 43.2  | 36.1  | 48.7  | 76.1  | 43.8  | 04:57:59  | 48.0  | 51.8  | 41.2  | 67.1  | 65.6  |
| 02:36:59  | 36.8  | 39.0  | 37.5  | 41.2  | 49.6  | 03:47:59  | 49.4  | 33.8  | 71.8  | 46.7  | 47.0  | 04:58:59  | 39.1  | 77.7  | 40.7  | 74.5  | 68.1  |
| 02:37:59  | 39.8  | 62.3  | 40.2  | 37.8  | 42.2  | 03:48:59  | 63.8  | 35.7  | 69.0  | 68.5  | 55.0  | 04:59:59  | 43.8  | 49.5  | 41.9  | 67.4  | 50.1  |
| LaFmax dB | ##    | 42.7  | ##    | 38.5  | 37.0  | LaFmax dB | 48.1  | 41.0  | 52.1  | ##    | ##    | LaFmax dB | ##    | ##    | 41.1  | 43.1  | 48.5  |
| Time      | Fig 1 | Fig 2 | Fig 3 | Fig 4 | Fig 5 | Time      | Fig 1 | Fig 2 | Fig 3 | Fig 4 | Fig 5 | Time      | Fig 1 | Fig 2 | Fig 3 | Fig 4 | Fig 5 |
| 05:00:59  | 74.4  | 37.6  | 41.8  | 79.9  | 48.8  | 05:40:59  | 74.4  | 47.9  | 55.4  | 69.2  | 54.2  | 06:20:59  | 63.3  | 55.3  | 54.9  | 72.2  | 75.5  |
| 05:01:59  | 75.7  | 38.9  | 43.1  | 46.0  | 50.0  | 05:41:59  | 50.0  | 50.3  | 48.3  | 71.4  | 73.6  | 06:21:59  | 79.1  | 69.0  | 69.4  | 82.6  | 73.0  |
| 05:02:59  | 44.7  | 42.2  | 38.4  | 45.6  | 48.8  | 05:42:59  | 71.7  | 70.4  | 52.7  | 53.8  | 65.3  | 06:22:59  | 73.2  | 50.4  | 59.1  | 75.5  | 57.2  |
| 05:03:59  | 46.0  | 44.2  | 42.3  | 44.1  | 48.2  | 05:43:59  | 64.5  | 54.9  | 51.4  | 53.9  | 73.0  | 06:23:59  | 77.5  | 54.6  | 53.4  | 77.9  | 75.5  |
| 05:04:59  | 51.3  | 45.6  | 39.9  | 48.6  | 51.0  | 05:44:59  | 50.0  | 70.2  | 50.2  | 51.3  | 57.3  | 06:24:59  | 75.7  | 75.7  | 54.1  | 77.9  | 78.0  |
| 05:05:59  | 48.2  | 44.2  | 41.6  | 46.4  | 51.0  | 05:45:59  | 51.9  | 48.9  | 50.2  | 78.3  | 78.2  | 06:25:59  | 73.3  | 52.4  | 52.6  | 78.1  | 66.3  |
| 05:06:59  | 47.6  | 44.7  | 48.5  | 69.1  | 53.4  | 05:46:59  | 75.3  | 50.0  | 49.4  | 72.5  | 70.7  | 06:26:59  | 74.2  | 71.1  | 53.9  | 75.1  | 80.1  |
| 05:07:59  | 45.9  | 43.8  | 38.8  | 45.9  | 76.4  | 05:47:59  | 73.2  | 53.5  | 74.3  | 67.5  | 58.3  | 06:27:59  | 74.2  | 51.5  | 54.1  | 76.5  | 80.3  |
| 05:08:59  | 68.1  | 46.4  | 43.8  | 73.7  | 52.1  | 05:48:59  | 67.2  | 51.8  | 47.8  | 70.8  | 57.6  | 06:28:59  | 50.6  | 53.6  | 72.5  | 76.4  | 76.3  |
| 05:09:59  | 47.1  | 67.9  | 44.1  | 47.5  | 66.4  | 05:49:59  | 76.3  | 54.7  | 50.2  | 57.9  | 54.5  | 06:29:59  | 69.9  | 51.9  | 69.5  | 73.5  | 72.7  |
| 05:10:59  | 50.2  | 64.9  | 47.1  | 46.0  | 77.0  | 05:50:59  | 70.5  | 75.9  | 47.3  | 74.6  | 69.1  | 06:30:59  | 69.7  | 50.7  | 53.2  | 75.7  | 77.3  |
| 05:11:59  | 48.9  | 66.5  | 49.2  | 47.6  | 75.2  | 05:51:59  | 70.1  | 50.5  | 48.0  | 74.6  | 72.2  | 06:31:59  | 71.6  | 51.0  | 75.5  | 55.5  | 77.6  |
| 05:12:59  | 52.3  | 61.9  | 44.7  | 75.4  | 48.0  | 05:52:59  | 68.1  | 49.7  | 47.4  | 60.5  | 53.1  | 06:32:59  | 74.8  | 51.5  | 53.4  | 70.1  | 76.8  |
| 05:13:59  | 43.6  | 58.7  | 40.7  | 61.5  | 46.5  | 05:53:59  | 75.1  | 75.3  | 49.9  | 77.8  | 77.2  | 06:33:59  | 80.1  | 68.5  | 69.8  | 71.4  | 74.3  |
| 05:14:59  | 49.5  | 43.8  | 44.8  | 45.7  | 47.7  | 05:54:59  | 76.6  | 73.1  | 46.2  | 70.0  | 73.7  | 06:34:59  | 63.8  | 53.8  | 77.2  | 77.9  | 92.4  |
| 05:15:59  | 52.5  | 39.5  | 75.3  | 49.3  | 47.5  | 05:55:59  | 75.3  | 52.4  | 45.2  | 53.6  | 54.0  | 06:35:59  | 78.0  | 61.9  | 59.5  | 70.3  | 77.3  |
| 05:16:59  | 73.7  | 39.2  | 40.7  | 47.3  | 76.4  | 05:56:59  | 72.6  | 78.1  | 53.4  | 71.5  | 65.4  | 06:36:59  | 66.9  | 59.3  | 45.7  | 67.1  | 65.3  |
| 05:17:59  | 60.2  | 47.2  | 76.4  | 72.3  | 45.5  | 05:57:59  | 54.8  | 54.1  | 73.0  | 76.8  | 79.7  | 06:37:59  | 72.7  | 54.7  | 45.6  | 71.7  | 76.9  |
| 05:18:59  | 50.2  | 76.7  | 42.8  | 64.0  | 45.8  | 05:58:59  | 50.4  | 52.1  | 49.5  | 62.5  | 61.8  | 06:38:59  | 70.5  | 66.5  | 45.1  | 75.0  | 71.6  |
| 05:19:59  | 67.2  | 44.8  | 44.9  | 74.8  | 51.3  | 05:59:59  | 72.7  | 61.8  | 49.4  | 66.8  | 66.6  | 06:39:59  | 76.0  | 54.5  | 67.0  | 77.2  | 77.1  |
| 05:20:59  | 52.2  | 45.6  | 44.5  | 61.1  | 69.3  | 06:00:59  | 52.1  | 53.8  | 50.1  | 49.8  | 52.1  | 06:40:59  | 75.6  | 76.1  | 75.3  | 68.5  | 76.5  |
| 05:21:59  | 50.6  | 53.0  | 44.6  | 64.7  | 50.1  | 06:01:59  | 53.5  | 73.7  | 77.5  | 60.3  | 53.8  | 06:41:59  | 76.2  | 73.7  | 54.2  | 53.0  | 98.6  |
| 05:22:59  | 69.8  | 78.8  | 47.0  | 73.8  | 47.8  | 06:02:59  | 50.9  | 54.3  | 77.9  | 74.7  | 74.6  | 06:42:59  | 76.5  | 62.2  | 73.6  | 71.0  | 72.9  |
| 05:23:59  | 44.7  | 73.4  | 44.5  | 68.5  | 52.3  | 06:03:59  | 75.4  | 53.4  | 49.8  | 70.1  | 53.8  | 06:43:59  | 77.6  | 69.3  | 49.8  | 76.3  | 68.9  |
| 05:24:59  | 48.6  | 60.4  | 45.0  | 81.5  | 51.3  | 06:04:59  | 54.5  | 52.7  | 52.6  | 74.0  | 75.1  | 06:44:59  | 74.7  | 76.7  | 74.7  | 74.0  | 71.0  |
| 05:25:59  | 51.6  | 62.2  | 44.2  | 73.0  | 49.3  | 06:05:59  | 59.5  | 53.5  | 58.1  | 73.1  | 74.9  | 06:45:59  | 69.9  | 63.6  | 51.6  | 78.2  | 75.0  |
| 05:26:59  | 49.2  | 74.8  | 43.0  | 67.3  | 52.1  | 06:06:59  | 70.1  | 54.3  | 58.9  | 64.2  | 70.5  | 06:46:59  | 67.3  | 61.7  | 60.5  | 78.5  | 77.3  |
| 05:27:59  | 47.3  | 60.8  | 68.3  | 74.6  | 52.3  | 06:07:59  | 77.6  | 67.9  | 51.9  | 58.2  | 71.3  | 06:47:59  | 75.4  | 66.1  | 71.4  | 74.7  | 77.2  |
| 05:28:59  | 72.3  | 59.3  | 48.2  | 58.4  | 52.1  | 06:08:59  | 58.0  | 52.4  | 51.0  | 71.3  | 63.5  | 06:48:59  | 77.7  | 72.0  | 46.0  | 74.7  | 78.5  |
| 05:29:59  | 52.0  | 60.9  | 45.5  | 76.2  | 75.9  | 06:09:59  | 79.4  | 53.6  | 47.9  | 50.6  | 56.3  | 06:49:59  | 74.9  | 61.5  | 50.4  | 76.9  | 71.2  |
| 05:30:59  | 71.2  | 76.0  | 46.0  | 71.2  | 69.1  | 06:10:59  | 54.6  | 72.9  | 48.5  | 69.6  | 58.6  | 06:50:59  | 76.3  | 75.8  | 51.6  | 77.1  | 72.6  |
| 05:31:59  | 74.8  | 65.3  | 44.5  | 73.0  | 76.9  | 06:11:59  | 61.3  | 69.6  | 73.2  | 76.3  | 73.4  | 06:51:59  | 72.5  | 51.6  | 75.2  | 73.3  | 82.2  |
| 05:32:59  | 50.8  | 64.1  | 46.2  | 80.1  | 50.9  | 06:12:59  | 55.0  | 71.5  | 56.7  | 73.1  | 51.2  | 06:52:59  | 76.2  | 73.5  | 78.7  | 73.6  | 74.8  |
| 05:33:59  | 78.0  | 64.0  | 48.7  | 75.9  | 51.0  | 06:13:59  | 66.9  | 63.0  | 53.1  | 58.5  | 76.7  | 06:53:59  | 75.3  | 75.1  | 45.1  | 78.1  | 78.6  |
| 05:34:59  | 69.9  | 63.1  | 45.4  | 71.5  | 49.5  | 06:14:59  | 69.6  | 43.7  | 52.7  | 68.6  | 75.8  | 06:54:59  | 77.1  | 67.9  | 45.8  | 73.0  | 75.2  |
| 05:35:59  | 73.6  | 66.5  | 51.4  | 64.1  | 67.8  | 06:15:59  | 77.1  | 55.6  | 71.9  | 75.9  | 74.5  | 06:55:59  | 74.1  | 77.8  | 71.1  | 80.0  | 77.1  |
| 05:36:59  | 67.1  | 44.7  | 47.2  | 74.2  | 79.2  | 06:16:59  | 68.5  | 58.0  | 47.9  | 68.4  | 74.5  | 06:56:59  | 80.7  | 65.1  | 76.2  | 74.2  | 75.8  |
| 05:37:59  | 72.9  | 48.0  | 50.1  | 74.0  | 75.8  | 06:17:59  | 51.5  | 56.2  | 52.3  | 65.4  | 60.1  | 06:57:59  | 74.6  | 71.0  | 75.5  | 76.1  | 71.4  |
| 05:38:59  | 55.7  | 49.4  | 45.0  | 49.2  | 71.3  | 06:18:59  | 72.9  | 57.7  | 53.7  | 63.3  | 72.9  | 06:58:59  | 79.2  | 70.5  | 49.5  | 80.2  | 77.3  |
| 05:39:59  | 74.1  | 49.5  | 56.2  | 48.2  | 56.2  | 06:19:59  | 62.5  | 67.2  | 73.3  | 71.5  | 72.2  | 06:59:59  | 74.0  | 75.2  | 77.3  | 73.2  | 76.5  |

## 19 APPENDIX C - ENVIRONMENTAL CONDITIONS



#END OF REPORT#