

Southern Court,  
Reading

Noise Assessment

February 2025

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## 1 Executive Summary

NRG Consulting have been commissioned to undertake an acoustic report to support a planning application for the proposed residential development at **5&6 Southern Court, South Street, Reading, RG1 4QS**.

The proposed description of development is for the:

*Conversion of the existing office building into 18 no. residential apartments (Class MA).*

Under the 'The Town and Country Planning (General Permitted Development) (England) (Amendment) Order 2016' and Order 2015 for Class MA applications, the developer is required to assess the impacts of noise from existing commercial premises on the intended occupiers of the proposed flats. The relevant text requirement from the order is reproduced below:

*"O.2.-(1) ... (d) and MA.2 - (1)... (d) impacts of noise from commercial premises on the intended occupiers of the development."*

Although not operating at the time of the site visits, it was identified that when in operation, there is a potential risk of fixed plant noise associated with the adjacent (3 & 4 South Street) commercial premises impacting the rear façade of the development site. Furthermore, as the proposed development is structurally attached to the 4 South Street commercial building, there is also risk of internal noise transfer across the party wall. Both elements have been considered in this report.

The main noise sources impacting the development site was observed to be from road traffic on South Street and within the NCP carpark at the rear of the site. Although not always a requirement for permitted developments, these external noise sources have also been considered for completeness.

The noise impact assessment has been carried out, using noise guideline values contained in British Standards BS 8233:2014, World Health Organisation guidelines on noise. An estimate of internal plant sound has also been assessed against appropriate Noise Rating curve criteria.

The findings of the assessment are reported herein and the layout of this report is as follows:

The existing site and proposed development are described in the following section of this report, whilst the legislation and criteria used for the assessment are included within Section 3. The noise survey is presented in Section 4. The noise assessment is addressed in Section 5. A scheme of noise mitigation is presented in Section 6. Finally, the conclusions of this study are summarised in Section 7. Figures and Tables are presented in Appendix 1 and 2, respectively. A description of useful acoustic terms can be found in Appendix 3.

## 2 Site Description and Proposed Development

### 2.1 Site Description

The site is a vacant three-storey (ground to third floor) office building located at 5&6 Southern Court, South Street, Reading, RG1 4QS.

The site is bounded to the north by South Street. South Street comprises a mix of residential and office buildings.

Adjoining the site to the east at 3 & 4 South Street are commercial offices.

Directly to the south of the site is South Street NCP carpark and the rear of the surrounding office buildings. Beyond the carpark is Kendrick School.

Directly to west is an alleyway separating the development building and offices at 7 & 8 South Street.

The location of site is shown in Figure 1.1 of Appendix 1.

### Proposed Development

The application seeks planning permission to convert of the existing office building into residential apartments (Class MA).

Existing site elevation drawings are presented in Figure 1.2 of Appendix 1.

Proposed site elevation and floor plans are presented in Figures 1.3 and 1.4 of Appendix 1, respectively.

### 2.2 Summary of Commercial Sound

During the site visits, there was no commercial sources influencing the sound environment. The external rear facade of the closest commercial unit at 3&4 South Street had 6 no. condenser units installed. However, at the time of the survey, the plant was not in operation.

The proposed development is structurally attached to the 4 South Street commercial building and there is a risk of internal noise transfer across the party wall, although, as previously mentioned, no sound was audible during the site visits.

There was no fixed plant or other commercial sound sources noted to be impacting the development from Kendrick School to the south of the site.

It is understood that the existing plant associated with 5 & 6 South Street is to be removed.

South Street Arts Centre is located c. 50m to the north west of the development site. No noise associated with the arts centre was present during the site visits. Any noise generating activities at the Art Centre are all undertaken within the building and due to the distance between the arts centre and the site, the risk of noise significantly impacting the development site is considered to be low. Any noise associated with the centre which occurred over the weekend period of the sound survey would have been captured on the unattended noise monitor located at the front of the site and would therefore form part of the noise assessment.

### Subjective Observations

The ambient sound environment at the site was influenced by passing traffic on South Street and from vehicles with the NCR carpark to the rear of the site.

### 3 Policy Framework

#### 3.1 Noise Policy Statement for England (NPSE)

The Noise Policy Statement for England (March 2010)<sup>i</sup>, sets out the long-term vision of Government noise policy.

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

- avoid significant adverse impacts on health and quality of life;
- mitigate and reduce to a minimum other adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life.

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

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

##### NOEL – No Observed Effect Level

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

##### LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

##### SOAEL – Significant Observed Adverse Effect Level

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

However the NPSE goes on to state that:

*'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.'*

#### 3.2 National Planning Policy Framework

In March 2012 the Department for Communities and Local Government published the National Planning Policy Framework (NPPF); an updated version was published in December 2024<sup>ii</sup>. The document sets out the Planning Policies for England and how these are to be applied.

The NPPF replaces many of the existing Planning Policy documents including Planning Policy Guidance 24: Planning and Noise (PPG24). PPG24 gave guidance on the control of noise to sensitive developments and has been used as the basis of assessment in all Local Authorities in England. The Framework allows local people and their council to produce their own distinctive local and neighbourhood plans, which reflect the needs and priorities of their communities.

It is stated that Planning Policies and decisions should contribute to and enhance the natural and local environment by:

- Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.

With regards to noise the Framework states that Planning Policies and decisions should also ensure that new development is appropriate for its location, taking into account the likely effects of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or wider area:

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

\* NPPF refers to The Noise Policy Statement for England, published by DEFRA in March 2010.

### 3.3 BS 8233: 2014 Sound Insulation and Noise Reduction for Buildings – Code of Practice

The scope of BS 8233: 2014<sup>iii</sup> includes the provision of recommendations for the control of noise in and around buildings. It suggests appropriate design guide noise limits for different situations, which are primarily intended to guide the design of new or refurbished buildings.

For steady external noise source, it is desirable that the internal ambient noise levels do not exceed the guideline values in Table 2 of BS 8233: 2014. This information has been reproduced below in Table 1 for ease of reference.

| Activity                   | Location          | 07:00 to 23:00                 | 23:00 to 07:00                |
|----------------------------|-------------------|--------------------------------|-------------------------------|
| Resting                    | Living room       | 35 dB $L_{Aeq, 16\text{hour}}$ | –                             |
| Dining                     | Dining room /area | 40 dB $L_{Aeq, 16\text{hour}}$ | –                             |
| Sleeping (daytime resting) | Bedroom           | 35 dB $L_{Aeq, 16\text{hour}}$ | 30 dB $L_{Aeq, 8\text{hour}}$ |

**Table 1:** BS 8233: 2014 Internal Noise Targets for Domestic Uses

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

In external amenity spaces, such as private gardens and patios, BS 8233 indicates that it is desirable that the external noise level in these areas does not exceed 50 dB  $L_{Aeq,T}$  with an upper guideline value of 55 dB  $L_{Aeq,T}$  in noisier environments.

### 3.4 World Health Organisation

The most recent WHO guidelines 'Environmental Noise Guidelines for the European Region'<sup>iv</sup> acknowledge that 'single event noise indicators such as the maximum sound pressure level are warranted in specific situations such as night time railway or aircraft noise events that can clearly elicit awakenings', however, the guidance indicates that 'the relationship between different types of single-event noise indicators and long-term health outcomes at the population level remains tentative' and therefore does not make any recommendations for single event noise indicators.

However, guideline values for community noise in specific environments are presented in the WHO's 'Guidelines for Community Noise'<sup>v</sup> document. The guideline values are presented overleaf in Table 2.

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

**Table 2:** WHO Guideline Noise Values

Notes[1]: For a good sleep, the WHO states that indoor sound pressure levels should not exceed approximately 45 dB L<sub>Amax</sub> more than 10–15 times per night.

The Night Noise Guidelines (NNG) for Europe<sup>vi</sup> is described as an extension of the WHO Guidelines for Community Noise publication. The threshold levels of noise exposure presented in the document are described as milestones in the process of evaluating the health consequences of environmental exposure. The health-based guideline values for the assessment and control of night noise exposure were derived from a review of available scientific evidence on the health effects of night noise. These include the effects and threshold levels for night time L<sub>Amax,F</sub>, which are lower than those presented in the WHO community noise guidelines. These revised levels are presented in Table 3 below.

| Specific Environment | Critical Health Effect(s)                          | dB L <sub>Aeq,T</sub>  | Time Base hours |
|----------------------|----------------------------------------------------|------------------------|-----------------|
| Sleep Quality        | Waking up in night and/or too early in the morning | dB L <sub>Amax,F</sub> | 42              |

**Table 3:** WHO Night-Time Noise Guidelines

### 3.5 Noise Rating (NR) curves

The Noise Rating (NR) curves presented in BS 8233 provide a method for assigning a single number to a noise spectrum, based on octave band noise levels with centre frequencies from 31.5 Hz to 8 kHz.

BS 8233 defines the NR as a method originally for use in assessing environmental noise but now used in the UK mainly for describing noise from mechanical ventilation systems in buildings. BS 8233 does not specify recommended curve values, but the Chartered Institution of Building Services Engineers (CIBSE) recommends noise levels for bedrooms within private residences as NR25.

1/1-octave band levels defined for the NR25 is presented below in Table 4.

| NR Curve | Sound Pressure Level, dB 1/1 Octave Band Centre Frequency (Hz) |    |     |     |     |      |      |      |      |
|----------|----------------------------------------------------------------|----|-----|-----|-----|------|------|------|------|
|          | 31                                                             | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
| NR25     | 72                                                             | 55 | 44  | 35  | 29  | 25   | 22   | 20   | 18   |

**Table 4:** 1/1 Octave Band Limits for NR 25 Curve

### Criteria Summary for the Noise Assessment

Taking into account the standard and guideline criteria discussed above, the noise impact assessment in this report will be undertaken in accordance with BS 8233:2014 to achieve internal noise levels which meet the desirable guideline values set out in Table 1 above.

An estimate of internal plant sound has been compared to the NR25 curve shown above in Table 4. Compliance with NR25 should indicate an avoidance of adverse impact from the commercial plant noise, inside the dwellings.

## 4 Environmental Noise Survey

### 4.1 Unattended Baseline Noise Survey

Unattended continuous monitoring of existing noise levels was undertaken at the monitoring locations shown as LT1 and LT2 on Figure 4.1 below.

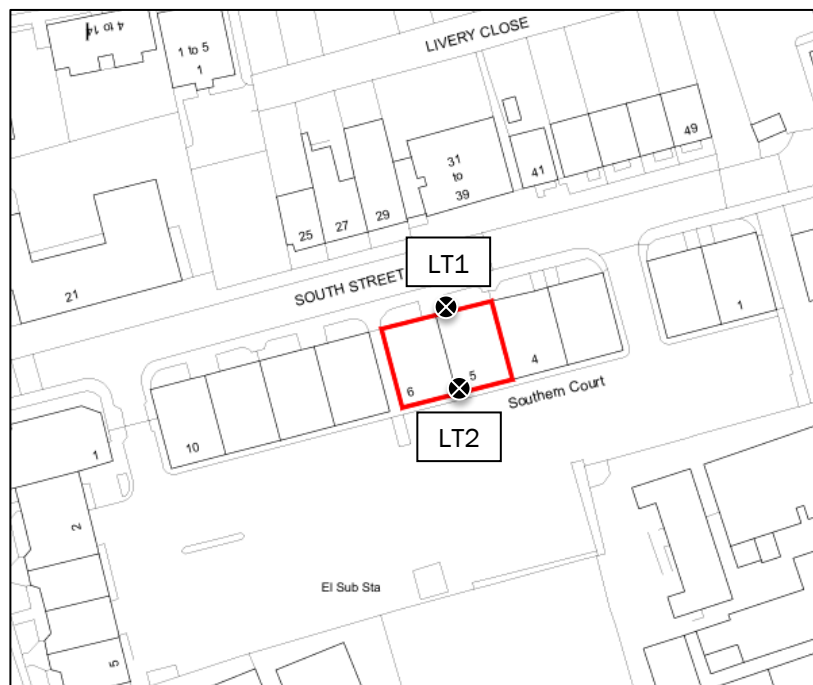


**Figure 4.1:** Unattended Noise Monitoring Locations

The equipment used during the survey is presented in Table 5 below.

| Monitoring Location | Manufacturer | Model No. | Description         | Serial No. | Calibration Due Date |
|---------------------|--------------|-----------|---------------------|------------|----------------------|
| LT1                 | Larson Davis | LxT       | Sound Level Meter   | 0006489    | January 2026         |
| LT2                 | Norsonic     | NOR-140   | Sound Level Meter   | 140326     | January 2026         |
| -                   | Larson Davis | CAL200    | Acoustic Calibrator | 12981      | April 2025           |

**Table 5:** Sound Monitoring Equipment

The sound level meters were powered by dry cell batteries and stored inside a weatherproof security box.

Photographs of the unattended noise monitoring equipment at LT1 and LT2 are shown in Figure 4.2 below.



**Figure 4.2:** Photographs Of Unattended Noise Monitoring Equipment

Measurements were obtained using the 'F' time weighting and A-weighting frequency network. The equipment was calibrated before and after the survey to generate a calibration level of 114.0 dB at 1 kHz.

At LT1, 15-minute measurements of  $L_{Amax,F}$ ,  $L_{Aeq,15min}$  and  $L_{A90,15min}$  noise levels were obtained between 12:45hrs Thursday 23<sup>rd</sup> January and 11:45hrs Monday 27<sup>th</sup> January 2025, with the microphone extended out of a front facing second floor window, approximately 8.0 m above ground level, in façade conditions.

At LT2, 15-minute measurements of  $L_{Amax,F}$ ,  $L_{Aeq,15min}$  and  $L_{A90,15min}$  noise levels were obtained between 13:40hrs Thursday 23<sup>rd</sup> January and 12:30hrs Monday 27<sup>th</sup> January 2025, with the microphone extended out of a rear facing second floor window, approximately 8.0 m above ground level, in façade conditions.

## 4.2 Attended Noise Measurements

To provide an indication of the sound reduction afforded by the existing glazing, an internal noise measurement was obtained inside an existing second floor room at the front of the site, with the windows closed. An external measurement was then made at the LT1 measurement position, at second floor level in façade conditions.

The external and internal noise measurements were obtained between 12:30hrs and 12:41hrs on Thursday 23<sup>rd</sup> January 2025 using the LT1 noise monitoring equipment presented in Table 5 above. The two measurements (internal and external) both contained vehicle passes on South Street and were therefore considered to provide a representative measure of the sound reduction provided by the glazing.

## Weather Conditions

Weather conditions during the site visits are presented below:

| Site Visit                            | Date and Time       | Weather Conditions                                        |
|---------------------------------------|---------------------|-----------------------------------------------------------|
| Noise Monitoring Equipment Setup      | 23/01/2025 13:00hrs | Light rain; 8°C; 98% humidity; Average windspeeds <1.2m/s |
| Noise Monitoring Equipment Collection | 27/01/2025 12:00hrs | Dry; 7°C; 88% humidity; Average windspeeds <0.5m/s        |

**Table 6:** Weather Conditions for Site Visit

A history of the weather conditions during the continuous survey period has been obtained from an internet source ([www.wunderground.com](http://www.wunderground.com)).

Analysis of the data captured during the unattended monitoring shows a period of unsettled weather, with periods of rain on all days surveyed. There was one day where wind gusts were over 5m/s.

Analysis of the noise dataset indicates that the rainfall and high wind gusts may have influenced the measured sound levels during the following periods and have therefore been discounted from the analysis:

- Between 02:00hrs and 09:00hrs on Friday 24<sup>th</sup> January.

The weather conditions obtained for the noise survey period is summarised in Figure 1.5 of Appendix 1.

### 4.3 Unattended Noise Survey Results

The results of the unattended noise measurement survey at LT1 are presented graphically in Figure 1.6 of Appendix 1, tabulated in Table 2.1 of Appendix 2 and summarised in Table 7 below.

| Date                        | Measured Façade Noise Levels, dB |                       |                       |                            |                      |                      |
|-----------------------------|----------------------------------|-----------------------|-----------------------|----------------------------|----------------------|----------------------|
|                             | Daytime (07:00 - 23:00)          |                       |                       | Night-time (23:00 - 07:00) |                      |                      |
|                             | L <sub>Amax,F</sub>              | L <sub>Aeq,16hr</sub> | L <sub>A90,16hr</sub> | L <sub>Amax,F</sub>        | L <sub>Aeq,8hr</sub> | L <sub>A90,8hr</sub> |
| Thu 23/01/25 <sup>[1]</sup> | 74(66-95)                        | 59                    | 52                    | 69(62-81) <sup>[3]</sup>   | 50 <sup>[3]</sup>    | 41 <sup>[3]</sup>    |
| Fri 24/01/25                | 72(66-82) <sup>[3]</sup>         | 57 <sup>[3]</sup>     | 50 <sup>[3]</sup>     | 69(59-88)                  | 52                   | 42                   |
| Sat 25/01/25                | 72(62-92)                        | 57                    | 48                    | 66(54-79)                  | 49                   | 39                   |
| Sun 26/01/25                | 72(64-87)                        | 58                    | 48                    | 65(57-78)                  | 51                   | 43                   |
| Mon 27/01/25 <sup>[2]</sup> | 73(65-87)                        | 59                    | 52                    | -                          | -                    | -                    |
| <b>Average</b>              | <b>73(72-74)</b>                 | <b>58</b>             | <b>50</b>             | <b>67(65-69)</b>           | <b>51</b>            | <b>41</b>            |

**Table 7:** Summary Of Unattended Noise Measurements, LT1

Notes: [1] Incomplete daytime period due to equipment setup; [2] Incomplete daytime period due to equipment collection; and [3] Measurements between 02:00hrs and 09:00hrs on Friday 24<sup>th</sup> January excluded due to adverse weather.

At LT1, the results of the unattended noise measurements show that ambient day time L<sub>Aeq,16hr</sub> sound levels, with periods of adverse weather removed, produced an arithmetic average of 58 dB L<sub>Aeq,16hr</sub>. The ambient night-time L<sub>Aeq,8hr</sub> sound levels, with periods of adverse weather removed, produced an arithmetic average of 51 dB L<sub>Aeq,8hr</sub>.

The results of the unattended noise measurement survey at LT2 are presented graphically in Figure 1.7 of Appendix 1, tabulated in Table 2.2 of Appendix 2 and summarised in Table 8 below.

| Date                        | Measured Façade Noise Levels, dB |                       |                       |                            |                      |                      |
|-----------------------------|----------------------------------|-----------------------|-----------------------|----------------------------|----------------------|----------------------|
|                             | Daytime (07:00 - 23:00)          |                       |                       | Night-time (23:00 - 07:00) |                      |                      |
|                             | L <sub>Amax,F</sub>              | L <sub>Aeq,16hr</sub> | L <sub>A90,16hr</sub> | L <sub>Amax,F</sub>        | L <sub>Aeq,8hr</sub> | L <sub>A90,8hr</sub> |
| Thu 23/01/25 <sup>[1]</sup> | 66(55-83)                        | 54                    | 50                    | 61(57-67) <sup>[3]</sup>   | 48 <sup>[3]</sup>    | 45 <sup>[3]</sup>    |
| Fri 24/01/25                | 68(58-80) <sup>[3]</sup>         | 54 <sup>[3]</sup>     | 49 <sup>[3]</sup>     | 60(52-76)                  | 48                   | 41                   |
| Sat 25/01/25                | 63(52-81)                        | 50                    | 45                    | 59(50-78)                  | 48                   | 44                   |
| Sun 26/01/25                | 68(59-82)                        | 55                    | 50                    | 62(52-74)                  | 49                   | 44                   |
| Mon 27/01/25 <sup>[2]</sup> | 70(56-82)                        | 56                    | 52                    | -                          | -                    |                      |
| <b>Average</b>              | <b>67(63-70)</b>                 | <b>54</b>             | <b>49</b>             | <b>61(59-62)</b>           | <b>48</b>            | <b>44</b>            |

**Table 8:** Summary Of Unattended Noise Measurements, LT2

Notes: [1] Incomplete daytime period due to equipment setup; [2] Incomplete daytime period due to equipment collection; and [3] Measurements between 02:00hrs and 09:00hrs on Friday 24th January excluded due to adverse weather.

At LT2, the results of the unattended noise measurements show that ambient day time L<sub>Aeq,16hr</sub> sound levels, with periods of adverse weather removed, produced an arithmetic average of 54 dB L<sub>Aeq,16hr</sub>. The ambient night-time L<sub>Aeq,8hr</sub> sound levels, with periods of adverse weather removed, produced an arithmetic average of 48 dB L<sub>Aeq,8hr</sub>.

#### 4.4 Attended Noise Measurement Results

The results of the attended noise measurements obtained on Thursday 23<sup>rd</sup> January 2025 are summarised below in Table 9.

| Measurement Location | Date     | Start Time | Measurement Duration (mins) | Measured Sound Pressure Level, dB 1/1 Octave Band Centre Frequency (Hz) |    |     |     |     |      |      |      |
|----------------------|----------|------------|-----------------------------|-------------------------------------------------------------------------|----|-----|-----|-----|------|------|------|
|                      |          |            |                             | dB (A), L <sub>Aeq,T</sub>                                              | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 |
| Internal             | 23/01/25 | 12:30      | 5                           | 33                                                                      | 52 | 47  | 36  | 35  | 31   | 25   | 23   |
| External             |          | 12:36      | 5                           | 62                                                                      | 71 | 64  | 61  | 56  | 58   | 54   | 48   |

**Table 9:** Summary Of Attended Noise Measurements

## 5 Assessment of Noise Levels

### 5.1 BS 8233:2014 Assessment

#### *Internal Ambient Noise Level Assessment*

The results from the continuous unattended noise measurements at LT1 and LT2 provide an indication of the typical diurnal variation in noise levels at the front and rear façades of the site, respectively.

As such, the measured ambient  $L_{Aeq,16hr}$  and  $L_{Aeq,8hr}$  noise levels presented in Tables 7 and 8 for the LT1 (front façade) and LT2 (rear façade) are adopted as the ambient noise levels for assessment purposes. A -3dB correction has been applied to the measured ambient noise levels to adjust from a façade level to free-field.

For assessment purposes, the front and rear façades have been assigned the receptor I.D's of R1 and R2.

BS 8233:2014 contains recommended guideline levels of 35 dB  $L_{Aeq,T}$  for resting inside bedrooms and living rooms during the daytime, 40 dB  $L_{Aeq,T}$  for dining areas and 30 dB  $L_{Aeq,T}$  for sleeping inside bedrooms at night.

Measurements obtained inside the proposed dwellings, as shown in Table 9, indicates an approximate sound reduction value of the existing window system of 29 dB.

Taking this typical sound reduction performance into consideration, internal noise levels have been predicted inside the habitable rooms at the assessment positions listed.

Noise levels have been calculated using the sound reduction values discussed above. The results for each receptor location are summarised in Table 10.

| Receptor I.D. | Representative Noise Monitoring Location | Façade | Measured Daytime Free-Field Noise Level $L_{Aeq,16hr}$ | Estimated Daytime Internal Noise Level, dB $L_{Aeq,16hr}$ [1] | Measured Night-Time Free-Field Noise Level $L_{Aeq,8hr}$ | Estimated Night-Time Internal Noise Level, dB $L_{Aeq,8hr}$ [1] |
|---------------|------------------------------------------|--------|--------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------|
| R1            | LT1                                      | North  | 55                                                     | 26                                                            | 48                                                       | 19                                                              |
| R2            | LT2                                      | South  | 51                                                     | 22                                                            | 47                                                       | 18                                                              |

**Table 10:** Assessment of Estimated Daytime and Night-Time Noise Levels

Notes: [1] assuming a 29 dB(A) reduction for closed windows.

Based on the assumed typical facade reduction described above, the noise predictions show that internal noise levels fall below the daytime and night-time guideline levels of 35dB  $L_{Aeq,16hr}$  and 30dB  $L_{Aeq,8hr}$  respectively, at the proposed development site.

### 5.2 Internal Maximum Noise Level Assessment

Maximum  $L_{Amax,F}$  noise levels generated at night have also been considered at the proposed development site.

WHO guideline noise criteria set an internal sleep disturbance noise limit of 42 dB  $L_{Amax,F}$  for the onset of critical health effects, which is a level which should not be exceeded on a regular basis. Based on an interpretation that for a noise to be regular, it needs to occur several (i.e., more than two) times per hour, the  $L_{Amax,F}$  noise needs to be based upon an average of at least 10-15 events that are typical in nature.

The 15-minute  $L_{Amax,F}$  data obtained at LT1 and LT2 has been analysed. The 90<sup>th</sup> percentile values of 71 dB  $L_{Amax,F}$  (free-field) and 65 dB  $L_{Amax,F}$  (free-field) at LT1 and LT2 have been established.

The typical facade reduction described above was then used to estimate internal  $L_{Amax,F}$  noise levels within habitable rooms on the development. The results are presented in Table 11.

| Calculation Receptor | Façade | Measured Free-field Night-Time Noise Level $L_{Amax,F}$ | Predicted Night-Time Internal Noise Level, dB $L_{Amax,F}$ [1] |
|----------------------|--------|---------------------------------------------------------|----------------------------------------------------------------|
| R1                   | North  | 71                                                      | 42                                                             |
| R2                   | South  | 65                                                      | 36                                                             |

**Table 11:** Assessment On Estimated  $L_{Amax,F}$  Levels Based on Typical Maximum Events

Note: [1] assuming a 29 dB(A) reduction for windows closed.

The results indicate that the WHO  $L_{Amax,F}$  criteria would be achieved within bedrooms on the front and rear facades.

### 5.3 NR25 Curve Noise Assessment

In addition to the average noise levels used for the internal noise level assessment, it is important to consider any frequency content of plant that has the potential to impact the future residents at the development.

As mentioned above in Section 4.4, BS 8233 does not specify recommended NR curve values, but the Chartered Institution of Building Services Engineers (CIBSE) recommends noise levels for bedrooms within private residences do not exceed NR25. As such, NR25 has been used as the applicable criteria for the private dwellings.

During the site visits, the fixed external plant items associated with 3 & 4 South Street were not operating. The specific model numbers of the existing plant is not known, however, 4 no. single Daikin inverter type units, 1 no. double Daikin inverter type unit and 1 no. single LG inverter unit were noted.

For assessment purposes, the following plant items have been considered. This plant is considered representative of the plant installed at 3 & 4 South Street.

- 4 no. Daikins RXS20 single outdoor units;
- 1 no. Daikin RZQS71DV1 double outdoor unit; and
- 1 no. LG single APNQ36GRA0 unit.

The sound levels associated with these units are summarised below in Table 12.

| Make / Model     | Sound Pressure Levels at 1m for a Single Units, dB 1/1 Octave Band Centre Frequency (Hz) |     |     |     |      |      |      |
|------------------|------------------------------------------------------------------------------------------|-----|-----|-----|------|------|------|
|                  | 63                                                                                       | 125 | 250 | 500 | 1000 | 2000 | 4000 |
| Daikin RXS20     | 40                                                                                       | 45  | 43  | 41  | 39   | 32   | 20   |
| LG APNQ36GRA0    | 52                                                                                       | 54  | 53  | 49  | 49   | 45   | 32   |
| Daikin RZQS71DV1 | 52                                                                                       | 50  | 52  | 48  | 47   | 51   | 38   |

**Table 12:** Reference Sound Pressure Levels of Condensing Plant

2 no. of the single Daikins RXS20 units and 1 no. LG single APNQ100LFA0 unit were approximately 2m from the closest window on the proposed development.

2 no. of the single Daikins RXS20 units and 1 no. Daikin RZQS71D7V1B double unit were approximately 8m from the closest development window.

For assessment purposes, the worst-case distance of 2m has been taken.

Table 13 below details the cumulative source noise levels in 1/1 octave bands, the measured sound reduction provided by the existing glazing system, an estimate of the the internal source noise and a comparison to the NR25 curve.

| NR Curve                                                                          | Sound Pressure Level, dB 1/1 Octave Band Centre Frequency (Hz) |     |     |     |      |      |      |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------|-----|-----|-----|------|------|------|
|                                                                                   | 63                                                             | 125 | 250 | 500 | 1000 | 2000 | 4000 |
| (a) Adopted Source Level, $L_{eq}$ (dB) - Daikins RXS20 <sup>[1]</sup>            | 46                                                             | 51  | 49  | 47  | 45   | 38   | 26   |
| (b) Adopted Source Level, $L_{eq}$ (dB) - LG single APNQ100LFA0                   | 52                                                             | 54  | 53  | 49  | 49   | 45   | 32   |
| (c) Daikin RZQS71D7V1B double                                                     | 52                                                             | 50  | 52  | 48  | 47   | 51   | 38   |
| (d) Distance Correction ( $20 \cdot \log(1/2)$ )                                  | -6                                                             | -6  | -6  | -6  | -6   | -6   | -6   |
| (e) Combined Source Level, $L_{eq}$ (dB) (a plus b plus c minus d) <sup>[2]</sup> | 50                                                             | 51  | 50  | 47  | 46   | 46   | 33   |
| (f) Measured Sound Reduction from Glazing (dB)                                    | -19                                                            | -17 | -25 | -21 | -27  | -29  | -26  |
| (g) Predicted Internal Noise Level, $L_{eq}$ (dB) (e minus g)                     | 31                                                             | 34  | 25  | 26  | 19   | 17   | 7    |
| (h) NR25 Curve (dB)                                                               | 55                                                             | 44  | 35  | 29  | 25   | 22   | 20   |
| Difference (g minus h)                                                            | -24                                                            | -10 | -10 | -3  | -6   | -5   | -13  |

**Table 13:** NR Curve Assessment

Notes: [1] Factored to 4 no. units ( $10 \cdot \log(4)$ ); and [2] logarithmic addition minus normal subtraction.

The results show that based on the assumptions stated, the external plant noise would not exceed the NR25 criteria in any 1/1 octave frequency band, within the habitable rooms on the development.

## 6 Noise Mitigation Strategy

### 6.1 Glazing Strategy

Based on the noise assessment, it is considered that the existing glazing system would be suitable should the developer choose for this to remain in situ.

Should the developer wish to replace the existing glazing system, standard double glazing which can provide a minimum sound level difference of 29 dB should be used for all habitable rooms on the development.

An example product is presented in Table 14 below.

| Sound Insulation Requirements | Appropriate Glazing Specification [4]   |
|-------------------------------|-----------------------------------------|
| R <sub>w</sub> 29dB           | 4mm glass / 16mm air cavity / 4mm glass |

**Table 14:** Appropriate Glazing Specifications for Development

### 6.2 Ventilation Strategy

The development will also need to incorporate a background ventilation system, in compliance with Approved Document F.<sup>vii</sup>

The ventilation requirements set out in Approved Document F can be delivered by a natural ventilation system or a mechanical ventilation system or a combination of both.

During the site visits, no passive ventilators were noted to be present. Should trickle ventilation be the preferred option and the developer wants to utilise the existing glazing system, acoustically treated trickle ventilation using passive wall ventilators could be considered.

### 6.3 Sound Insulation of Party Wall Separating the Commercial Premises and Development

During the site visit, the adjoining premises appeared to be offices. However, the premises was vacant with no activity inside.

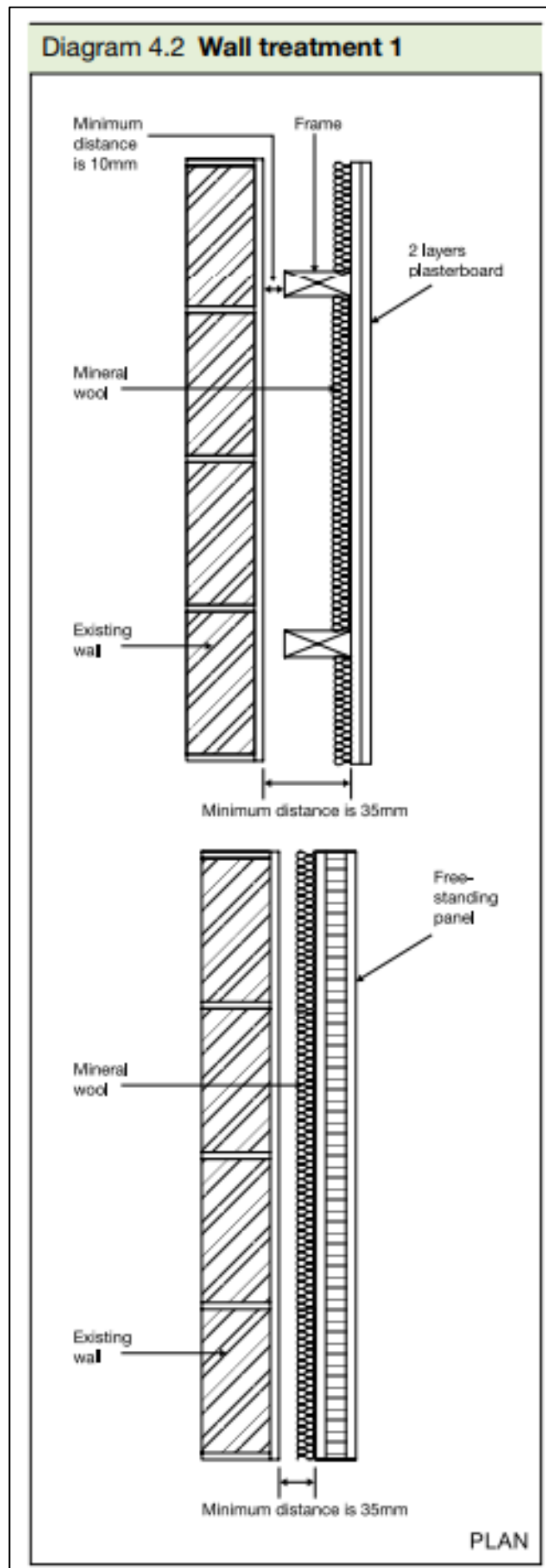
If the existing or future use of the adjoining premises is to remain as office space, typically offices generate low sound levels, and enhancing the sound insulation of adjoining partitions is not always necessary.

However, should consideration be given by the developer to enhance the internal sound insulation to minimise the risk of internal noise transfer, one way to do this would be to introduce an independent panel system on the party wall.

For an independent panel system with absorbent material the following guidance is provided in Approved Document E (ADE):

- the minimum mass of the panel should be 20kg/m<sup>2</sup>;
- each panel should consist of at least two layers of plasterboard with staggered joints;
- if the panels are free-standing they should be at least 35mm from the masonry core;
- if the panels are supported on a frame, there should be a gap of at least 10mm between the frame and the face of the existing wall; and
- mineral wool, min. density 10kg/m<sup>3</sup> and minimum thickness 35mm, in the cavity between the panel and the existing wall.

Figure 7.1 below shows the recommended wall treatment provided in ADE.



## 7 Conclusion

NRG Consulting have been commissioned to undertake an acoustic report to support a planning application for the proposed residential development at **5&6 Southern Court, South Street, Reading, RG1 4QS**.

The application seeks planning permission under permitted development rights to convert of the existing office building into 18 no. residential apartments.

Under the 'The Town and Country Planning (General Permitted Development) (England) (Amendment) Order 2016' the developer is required to assess the impacts of noise from existing commercial premises on the intended occupiers of the proposed apartments.

Although not a requirement for permitted developments, both commercial and non-commercial noise sources have been considered.

The existing noise environment has been established, which is considered representative of the development site, through unattended noise monitoring.

Attended external and internal noise measurements were also made to provide an indication of the sound reduction afforded by the existing glazing system.

An assessment of predicted internal noise levels, has shown that, the recommended guideline levels prescribed in BS8233:2014 will be achieved within habitable rooms, with the existing glazing system installed at the property.

An estimate of internal plant sound has been undertaken using 1/1 octave band sound reduction values provided by the existing glazing system, with the estimated internal sound compared to the NR25 curve. The results of the assessment show that the internal plant noise falls below the NR25 criteria in all octave bands.

Should the developer choose to replace the existing glazing system, an appropriate glazing specification is provided in Section 6. Ventilation options are also presented in Section 7.

During the site visits, the adjoining premises appeared to be offices. However, the premises was vacant with no activity inside. Offices typically generate low sound levels, and a requirement to enhance the sound insulation of separating partitions is not always necessary. However, should consideration be given by the developer to enhance the sound insulation of the party to minimise the risk of internal noise transfer, one way to do this would be to introduce an independent panel system on the party wall. This is discussed in Section 7.

Based on our survey and this report, noise from commercial premises should not be a barrier to the granting of planning permission for the scheme.

### Disclaimer

The contents of this report are based on drawings, specifications, and information provided, supplemented by assumptions made by NRG to achieve compliance.

NRG bears no responsibility to third parties for any use or interpretation of this report. Third parties act on the report's contents at their own risk.

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This report has been produced by NRG Consulting (NRG) to support a Planning Application. It should not be relied upon at construction stage, for Building Control compliance, or to be used in the discharge of Planning Conditions

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- <sup>i</sup> Department for Environment, Food and Rural Affairs (DEFRA). Noise Policy Statement for England (NPSE), 2010.
  - <sup>ii</sup> Department of Communities and Local Government. National Planning Policy Framework, 2024
  - <sup>iii</sup> British Standard BS 8233: 2014. Guidance on sound insulation and noise reduction in buildings.
  - <sup>iv</sup> World Health Organisation. 2018. Environmental Noise Guidelines for the European Region.
  - <sup>v</sup> World Health Organisation. 1999. Guidelines for Community Noise.
  - <sup>vi</sup> World Health Organisation. Night Noise Guidelines for Europe. 2009..
  - <sup>vii</sup> The Building Regulations 2010. Approved Document F.

# Appendix 1



DO NOT SCALE FROM THIS DRAWING. REPORT ANY DISCREPANCIES TO:  
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| TURNER<br>JACKSON+DAY<br>ASSOCIATES                                                                           |                   |                |            |
| Suite 1000<br>1000 King Street<br>London EC1A 1BB<br>Tel: 020 7460 1000<br>Email: info@turnerjacksonday.co.uk |                   |                |            |
| Project Name<br>5-6 Southern Court<br>South Street, Reading<br>Project Ref<br>Block and Location Plan         |                   |                |            |
| Date<br>Dec 24                                                                                                | Scale<br>as noted | Drawn by<br>NS | Checked by |
| Project No<br>1944                                                                                            | Drawing No<br>001 | Version        |            |

PRELIMINARY

Figure 1.1: Location Of Proposed Development Site



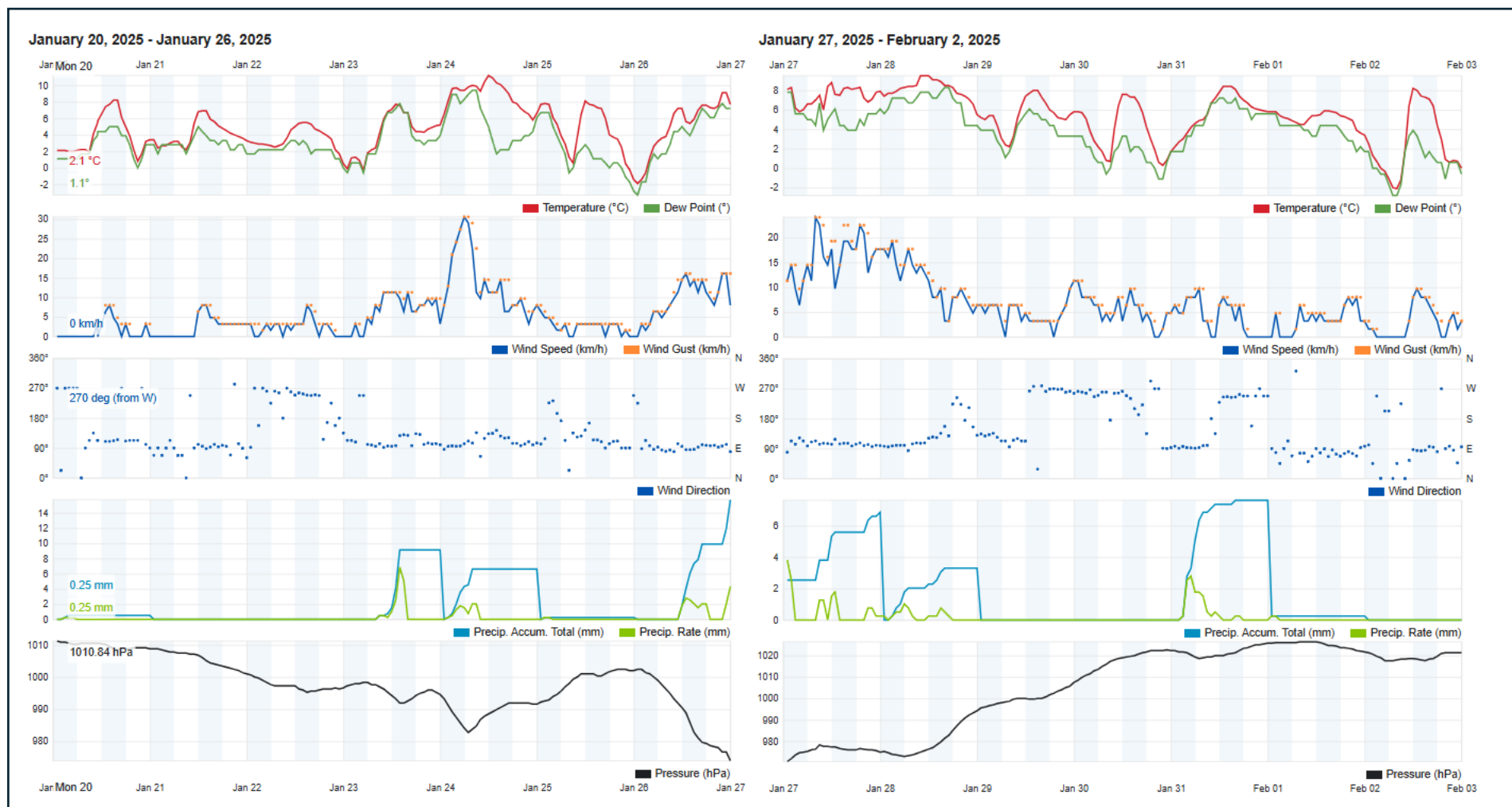


Figure 1.5: Weather Data During Unattended Noise Monitoring Period

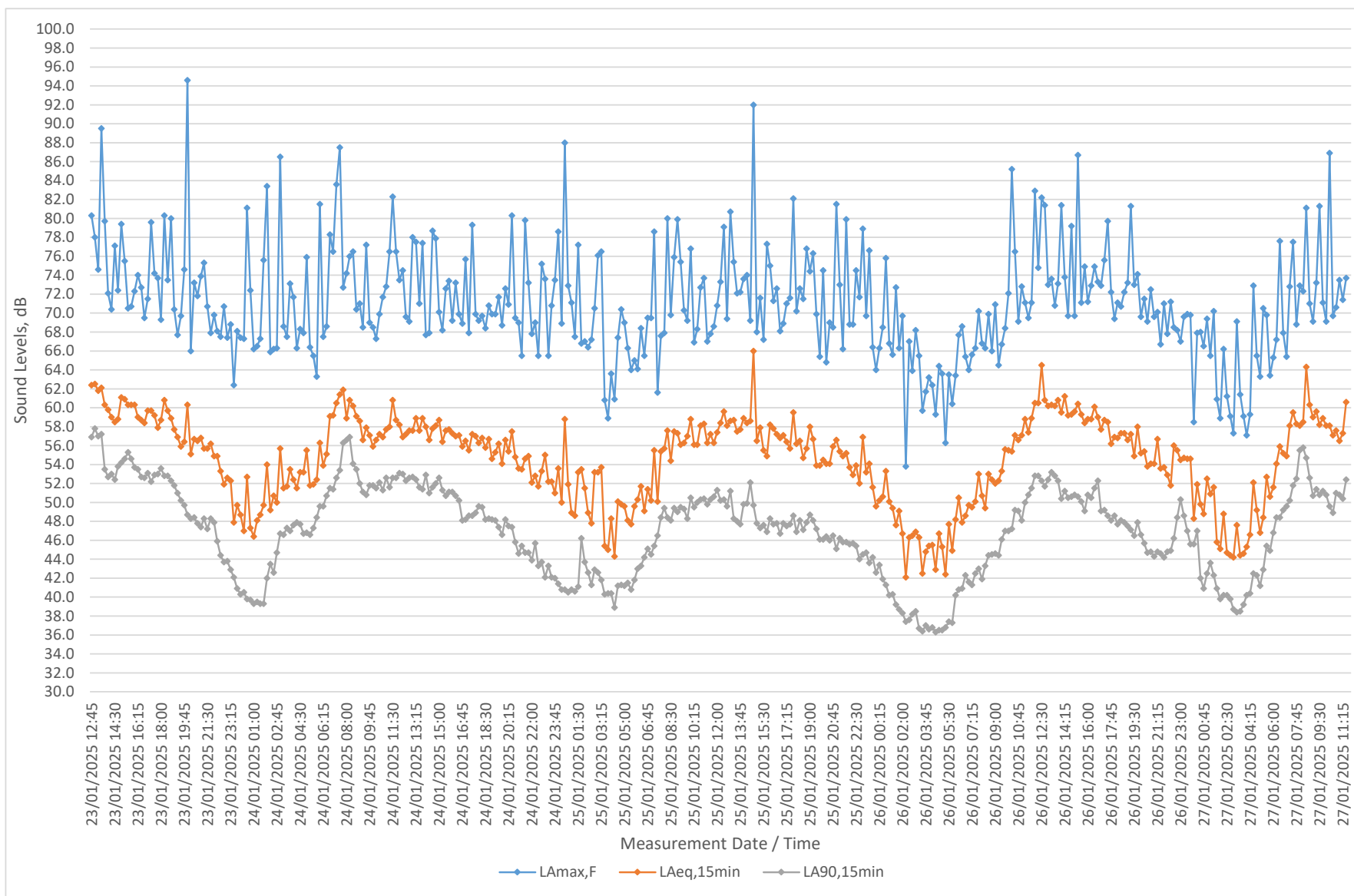


**Figure 1.6:** Time History of Continuous Noise Monitoring Data at LT1

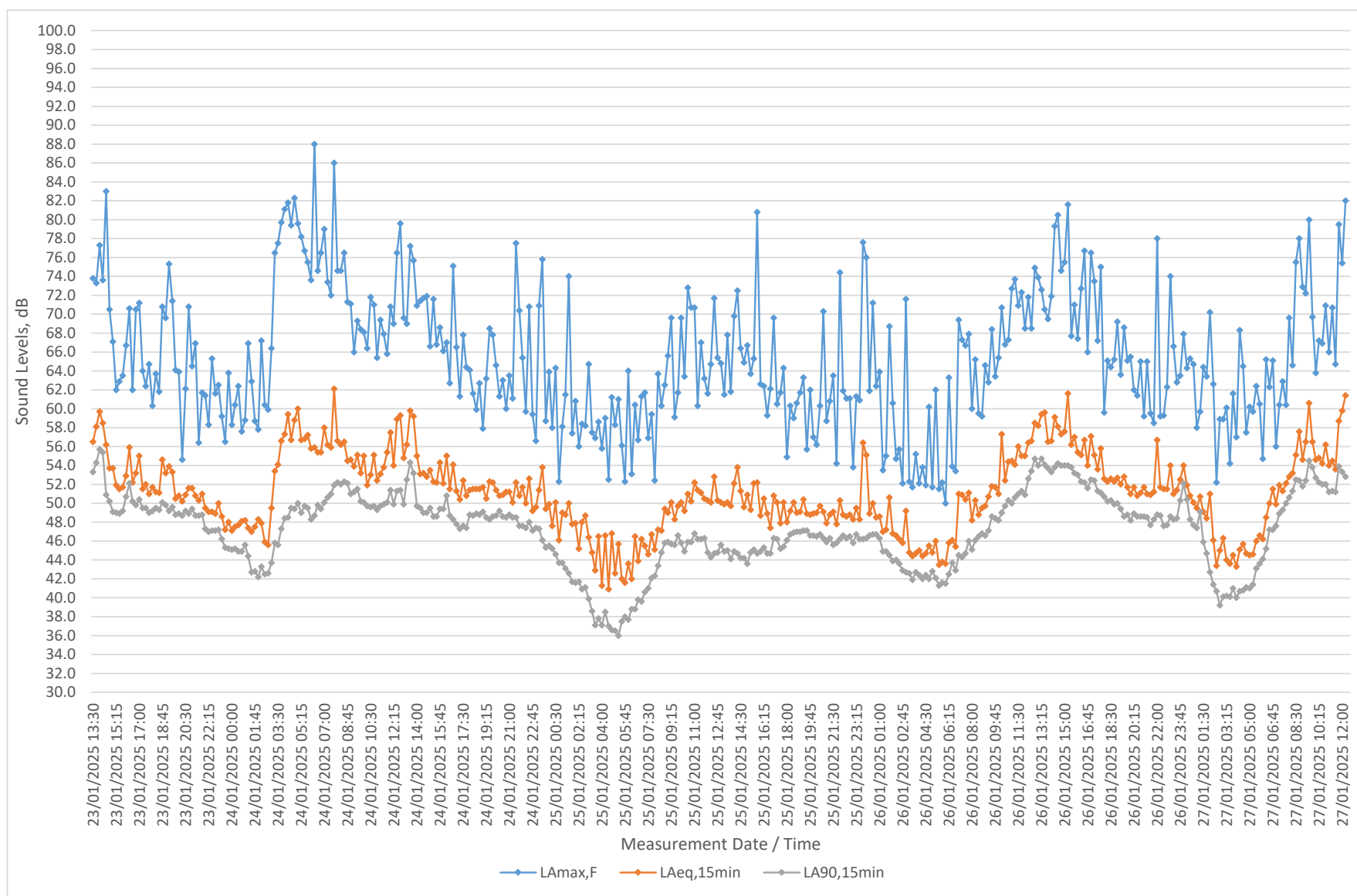


**Figure 1.7:** Time History of Continuous Noise Monitoring Data at LT2

# Appendix 2



| Date of Meas.                          | Start Time | Measured Façade Sound Levels, dB |                      |                        |
|----------------------------------------|------------|----------------------------------|----------------------|------------------------|
|                                        |            | L <sub>Amax,F</sub>              | L <sub>Aeq,8hr</sub> | L <sub>A90,15min</sub> |
| Thursday 23 <sup>rd</sup> January 2025 | 12:45      | 80.3                             | 62.4                 | 56.9                   |
|                                        | 13:00      | 78.0                             | 62.5                 | 57.8                   |
|                                        | 13:15      | 74.6                             | 61.8                 | 57.0                   |
|                                        | 13:30      | 89.5                             | 62.1                 | 57.2                   |
|                                        | 13:45      | 79.7                             | 60.3                 | 53.5                   |
|                                        | 14:00      | 72.1                             | 59.8                 | 52.7                   |
|                                        | 14:15      | 70.4                             | 59.0                 | 53.0                   |
|                                        | 14:30      | 77.1                             | 58.5                 | 52.4                   |
|                                        | 14:45      | 72.4                             | 58.8                 | 53.8                   |
|                                        | 15:00      | 79.4                             | 61.1                 | 54.2                   |
|                                        | 15:15      | 75.5                             | 60.9                 | 54.6                   |
|                                        | 15:30      | 70.5                             | 60.3                 | 55.3                   |
|                                        | 15:45      | 70.7                             | 60.3                 | 54.6                   |
|                                        | 16:00      | 72.3                             | 60.3                 | 53.7                   |
|                                        | 16:15      | 74.0                             | 59.0                 | 53.5                   |
|                                        | 16:30      | 72.7                             | 58.7                 | 52.7                   |
|                                        | 16:45      | 69.5                             | 58.4                 | 52.6                   |
|                                        | 17:00      | 71.5                             | 59.7                 | 53.1                   |
|                                        | 17:15      | 79.6                             | 59.7                 | 52.2                   |
|                                        | 17:30      | 74.2                             | 59.2                 | 52.9                   |
|                                        | 17:45      | 73.7                             | 57.9                 | 53.0                   |
|                                        | 18:00      | 69.3                             | 58.7                 | 53.6                   |
|                                        | 18:15      | 80.3                             | 60.8                 | 52.8                   |
|                                        | 18:30      | 73.5                             | 59.7                 | 52.8                   |
|                                        | 18:45      | 80.0                             | 58.9                 | 52.3                   |
|                                        | 19:00      | 70.4                             | 57.7                 | 51.8                   |
|                                        | 19:15      | 67.7                             | 56.9                 | 51.0                   |

|                                      |       |      |      |      |
|--------------------------------------|-------|------|------|------|
|                                      | 19:30 | 69.7 | 55.9 | 50.2 |
|                                      | 19:45 | 74.6 | 56.4 | 49.7 |
|                                      | 20:00 | 94.6 | 60.3 | 48.7 |
|                                      | 20:15 | 66.0 | 55.1 | 48.3 |
|                                      | 20:30 | 73.2 | 56.7 | 48.4 |
|                                      | 20:45 | 71.8 | 56.5 | 47.8 |
|                                      | 21:00 | 73.9 | 56.8 | 47.4 |
|                                      | 21:15 | 75.3 | 55.7 | 48.3 |
|                                      | 21:30 | 70.7 | 55.7 | 47.2 |
|                                      | 21:45 | 67.9 | 56.2 | 48.3 |
|                                      | 22:00 | 69.8 | 54.9 | 47.9 |
|                                      | 22:15 | 68.1 | 54.9 | 45.9 |
|                                      | 22:30 | 67.5 | 53.3 | 44.4 |
|                                      | 22:45 | 70.7 | 51.9 | 43.7 |
|                                      | 23:00 | 67.4 | 52.6 | 43.8 |
|                                      | 23:15 | 68.8 | 52.3 | 42.9 |
|                                      | 23:30 | 62.4 | 47.9 | 42.1 |
|                                      | 23:45 | 68.1 | 49.7 | 40.9 |
| Friday 24 <sup>th</sup> January 2025 | 00:00 | 67.4 | 48.7 | 40.3 |
|                                      | 00:15 | 67.3 | 47.0 | 40.5 |
|                                      | 00:30 | 81.1 | 52.7 | 39.8 |
|                                      | 00:45 | 72.4 | 47.3 | 39.7 |
|                                      | 01:00 | 66.2 | 46.4 | 39.3 |
|                                      | 01:15 | 66.5 | 48.1 | 39.5 |
|                                      | 01:30 | 67.3 | 48.7 | 39.3 |
|                                      | 01:45 | 75.6 | 49.7 | 39.3 |
|                                      | 02:00 | 83.4 | 54.0 | 42.0 |
|                                      | 02:15 | 65.9 | 49.2 | 43.5 |
|                                      | 02:30 | 66.2 | 50.7 | 42.6 |
|                                      | 02:45 | 66.3 | 50.0 | 44.7 |

|  |       |      |      |      |
|--|-------|------|------|------|
|  | 03:00 | 86.5 | 55.7 | 46.7 |
|  | 03:15 | 68.6 | 51.5 | 46.6 |
|  | 03:30 | 67.5 | 51.7 | 47.3 |
|  | 03:45 | 73.1 | 53.5 | 47.0 |
|  | 04:00 | 71.7 | 52.4 | 47.6 |
|  | 04:15 | 66.3 | 51.5 | 47.9 |
|  | 04:30 | 68.3 | 53.2 | 47.7 |
|  | 04:45 | 67.9 | 53.2 | 46.7 |
|  | 05:00 | 75.9 | 55.5 | 46.8 |
|  | 05:15 | 66.4 | 51.8 | 46.6 |
|  | 05:30 | 65.5 | 51.9 | 47.3 |
|  | 05:45 | 63.3 | 52.4 | 48.4 |
|  | 06:00 | 81.5 | 56.3 | 49.6 |
|  | 06:15 | 67.5 | 53.9 | 49.6 |
|  | 06:30 | 68.6 | 55.1 | 50.7 |
|  | 06:45 | 78.3 | 59.1 | 51.5 |
|  | 07:00 | 76.5 | 59.2 | 51.4 |
|  | 07:15 | 83.6 | 60.5 | 52.6 |
|  | 07:30 | 87.5 | 61.4 | 53.4 |
|  | 07:45 | 72.7 | 61.9 | 56.3 |
|  | 08:00 | 74.2 | 58.9 | 56.6 |
|  | 08:15 | 76.0 | 60.8 | 56.9 |
|  | 08:30 | 76.5 | 60.2 | 54.1 |
|  | 08:45 | 70.4 | 59.1 | 53.5 |
|  | 09:00 | 71.0 | 58.6 | 52.0 |
|  | 09:15 | 68.5 | 56.6 | 51.1 |
|  | 09:30 | 77.2 | 57.9 | 50.8 |
|  | 09:45 | 69.0 | 57.1 | 51.8 |
|  | 10:00 | 68.5 | 55.9 | 51.8 |
|  | 10:15 | 67.3 | 56.6 | 51.5 |

|  |       |      |      |      |
|--|-------|------|------|------|
|  | 10:30 | 69.9 | 57.2 | 52.1 |
|  | 10:45 | 71.7 | 56.9 | 51.3 |
|  | 11:00 | 72.8 | 57.7 | 52.6 |
|  | 11:15 | 76.5 | 58.0 | 51.6 |
|  | 11:30 | 82.3 | 60.8 | 52.6 |
|  | 11:45 | 76.5 | 58.7 | 52.6 |
|  | 12:00 | 73.5 | 58.2 | 53.1 |
|  | 12:15 | 74.5 | 56.9 | 53.0 |
|  | 12:30 | 69.6 | 57.2 | 52.3 |
|  | 12:45 | 69.1 | 57.6 | 52.6 |
|  | 13:00 | 78.0 | 57.6 | 52.7 |
|  | 13:15 | 77.5 | 58.9 | 52.4 |
|  | 13:30 | 71.0 | 57.6 | 51.6 |
|  | 13:45 | 77.4 | 58.9 | 51.4 |
|  | 14:00 | 67.7 | 58.0 | 52.9 |
|  | 14:15 | 67.9 | 56.6 | 51.0 |
|  | 14:30 | 78.7 | 57.8 | 51.6 |
|  | 14:45 | 77.9 | 58.1 | 52.0 |
|  | 15:00 | 70.1 | 58.7 | 52.6 |
|  | 15:15 | 68.2 | 56.4 | 51.3 |
|  | 15:30 | 72.6 | 57.6 | 50.7 |
|  | 15:45 | 73.4 | 57.7 | 51.1 |
|  | 16:00 | 69.2 | 57.3 | 51.1 |
|  | 16:15 | 73.2 | 57.0 | 50.7 |
|  | 16:30 | 69.9 | 57.1 | 50.2 |
|  | 16:45 | 68.9 | 55.9 | 48.1 |
|  | 17:00 | 75.7 | 56.5 | 48.2 |
|  | 17:15 | 67.9 | 55.5 | 48.6 |
|  | 17:30 | 79.3 | 57.2 | 48.6 |
|  | 17:45 | 69.9 | 57.0 | 48.9 |

|                                        |       |      |      |      |
|----------------------------------------|-------|------|------|------|
|                                        | 18:00 | 69.2 | 56.3 | 49.6 |
|                                        | 18:15 | 69.7 | 56.8 | 49.5 |
|                                        | 18:30 | 68.4 | 55.8 | 48.2 |
|                                        | 18:45 | 70.8 | 56.7 | 48.3 |
|                                        | 19:00 | 69.9 | 54.6 | 48.2 |
|                                        | 19:15 | 69.9 | 55.3 | 48.1 |
|                                        | 19:30 | 71.7 | 56.2 | 47.4 |
|                                        | 19:45 | 68.7 | 54.1 | 46.6 |
|                                        | 20:00 | 72.6 | 56.6 | 48.2 |
|                                        | 20:15 | 70.9 | 55.4 | 47.5 |
|                                        | 20:30 | 80.3 | 57.5 | 47.4 |
|                                        | 20:45 | 69.5 | 54.8 | 45.8 |
|                                        | 21:00 | 69.0 | 53.6 | 44.6 |
|                                        | 21:15 | 65.5 | 53.5 | 45.4 |
|                                        | 21:30 | 79.8 | 54.6 | 44.7 |
|                                        | 21:45 | 73.2 | 54.9 | 44.7 |
|                                        | 22:00 | 67.8 | 52.1 | 43.9 |
|                                        | 22:15 | 69.0 | 52.8 | 45.7 |
|                                        | 22:30 | 65.5 | 51.7 | 43.3 |
|                                        | 22:45 | 75.2 | 53.3 | 43.7 |
|                                        | 23:00 | 73.6 | 55.0 | 42.1 |
|                                        | 23:15 | 65.5 | 52.2 | 43.3 |
|                                        | 23:30 | 70.8 | 52.2 | 42.1 |
|                                        | 23:45 | 73.5 | 51.0 | 42.0 |
| Saturday 25 <sup>th</sup> January 2025 | 00:00 | 78.6 | 53.6 | 41.4 |
|                                        | 00:15 | 68.9 | 50.0 | 40.8 |
|                                        | 00:30 | 88.0 | 58.8 | 40.8 |
|                                        | 00:45 | 72.9 | 51.9 | 40.5 |
|                                        | 01:00 | 71.1 | 48.9 | 40.8 |
|                                        | 01:15 | 67.5 | 48.6 | 40.6 |

|  |       |      |      |      |
|--|-------|------|------|------|
|  | 01:30 | 77.2 | 53.2 | 41.1 |
|  | 01:45 | 66.8 | 53.5 | 46.2 |
|  | 02:00 | 67.0 | 51.5 | 43.7 |
|  | 02:15 | 66.4 | 48.9 | 42.6 |
|  | 02:30 | 67.2 | 47.8 | 41.3 |
|  | 02:45 | 70.5 | 53.2 | 42.9 |
|  | 03:00 | 76.1 | 53.2 | 42.6 |
|  | 03:15 | 76.5 | 53.7 | 41.8 |
|  | 03:30 | 60.8 | 45.4 | 40.3 |
|  | 03:45 | 58.9 | 45.0 | 40.4 |
|  | 04:00 | 63.6 | 48.3 | 40.4 |
|  | 04:15 | 60.9 | 44.3 | 38.9 |
|  | 04:30 | 67.4 | 50.1 | 41.2 |
|  | 04:45 | 70.4 | 49.8 | 41.3 |
|  | 05:00 | 69.0 | 49.6 | 41.2 |
|  | 05:15 | 66.3 | 48.1 | 41.5 |
|  | 05:30 | 64.0 | 47.7 | 40.8 |
|  | 05:45 | 65.0 | 49.6 | 41.8 |
|  | 06:00 | 64.1 | 50.3 | 43.0 |
|  | 06:15 | 68.4 | 51.7 | 43.3 |
|  | 06:30 | 65.5 | 49.1 | 44.2 |
|  | 06:45 | 69.5 | 51.4 | 45.1 |
|  | 07:00 | 69.5 | 50.2 | 44.5 |
|  | 07:15 | 78.6 | 55.5 | 45.4 |
|  | 07:30 | 61.6 | 50.1 | 46.5 |
|  | 07:45 | 67.6 | 55.4 | 48.4 |
|  | 08:00 | 67.9 | 55.7 | 49.4 |
|  | 08:15 | 80.0 | 57.6 | 48.4 |
|  | 08:30 | 69.8 | 54.4 | 48.1 |
|  | 08:45 | 75.9 | 57.5 | 49.4 |

|  |       |      |      |      |
|--|-------|------|------|------|
|  | 09:00 | 79.9 | 57.3 | 49.0 |
|  | 09:15 | 75.4 | 56.1 | 49.5 |
|  | 09:30 | 70.3 | 56.3 | 49.3 |
|  | 09:45 | 69.2 | 57.0 | 48.3 |
|  | 10:00 | 76.8 | 58.8 | 50.5 |
|  | 10:15 | 66.9 | 56.1 | 49.5 |
|  | 10:30 | 68.3 | 56.1 | 50.0 |
|  | 10:45 | 72.7 | 58.1 | 50.3 |
|  | 11:00 | 73.7 | 58.3 | 50.4 |
|  | 11:15 | 67.0 | 56.3 | 49.8 |
|  | 11:30 | 67.8 | 57.2 | 50.3 |
|  | 11:45 | 68.6 | 56.3 | 50.6 |
|  | 12:00 | 70.8 | 57.4 | 51.3 |
|  | 12:15 | 73.3 | 58.4 | 50.2 |
|  | 12:30 | 79.1 | 59.6 | 50.3 |
|  | 12:45 | 69.4 | 58.1 | 49.6 |
|  | 13:00 | 80.7 | 58.6 | 51.2 |
|  | 13:15 | 75.4 | 58.7 | 48.3 |
|  | 13:30 | 72.1 | 57.5 | 48.0 |
|  | 13:45 | 72.2 | 57.7 | 47.7 |
|  | 14:00 | 73.6 | 58.9 | 49.8 |
|  | 14:15 | 74.0 | 58.4 | 49.9 |
|  | 14:30 | 69.2 | 58.6 | 52.1 |
|  | 14:45 | 92.0 | 66.0 | 49.7 |
|  | 15:00 | 68.0 | 56.5 | 47.8 |
|  | 15:15 | 71.6 | 57.9 | 47.3 |
|  | 15:30 | 67.2 | 55.5 | 47.6 |
|  | 15:45 | 77.3 | 54.9 | 46.9 |
|  | 16:00 | 75.0 | 58.2 | 48.3 |
|  | 16:15 | 71.3 | 57.8 | 47.7 |

|  |       |      |      |      |
|--|-------|------|------|------|
|  | 16:30 | 72.6 | 57.2 | 47.8 |
|  | 16:45 | 68.1 | 56.8 | 46.7 |
|  | 17:00 | 68.9 | 57.1 | 47.8 |
|  | 17:15 | 71.0 | 56.4 | 47.5 |
|  | 17:30 | 71.6 | 55.7 | 47.7 |
|  | 17:45 | 82.1 | 59.5 | 48.6 |
|  | 18:00 | 70.2 | 56.2 | 46.9 |
|  | 18:15 | 72.6 | 56.5 | 48.1 |
|  | 18:30 | 71.5 | 54.7 | 47.1 |
|  | 18:45 | 76.8 | 55.7 | 47.9 |
|  | 19:00 | 74.4 | 58.0 | 48.7 |
|  | 19:15 | 76.3 | 56.7 | 48.1 |
|  | 19:30 | 69.9 | 53.9 | 47.2 |
|  | 19:45 | 65.4 | 53.9 | 46.1 |
|  | 20:00 | 74.5 | 54.5 | 46.1 |
|  | 20:15 | 64.8 | 54.1 | 46.4 |
|  | 20:30 | 69.0 | 54.1 | 46.0 |
|  | 20:45 | 68.5 | 55.9 | 46.5 |
|  | 21:00 | 81.5 | 56.6 | 45.1 |
|  | 21:15 | 73.0 | 55.4 | 46.2 |
|  | 21:30 | 66.2 | 54.9 | 45.8 |
|  | 21:45 | 79.9 | 55.2 | 45.8 |
|  | 22:00 | 68.8 | 53.7 | 45.6 |
|  | 22:15 | 68.8 | 52.9 | 45.7 |
|  | 22:30 | 74.5 | 53.9 | 45.4 |
|  | 22:45 | 71.7 | 52.0 | 44.0 |
|  | 23:00 | 78.9 | 56.9 | 44.5 |
|  | 23:15 | 69.7 | 53.2 | 44.7 |
|  | 23:30 | 76.6 | 54.1 | 43.6 |
|  | 23:45 | 66.4 | 51.6 | 44.2 |

|                                      |       |      |      |      |
|--------------------------------------|-------|------|------|------|
| Sunday 26 <sup>th</sup> January 2025 | 00:00 | 64.0 | 49.6 | 42.6 |
|                                      | 00:15 | 66.3 | 50.2 | 43.4 |
|                                      | 00:30 | 68.5 | 50.6 | 41.9 |
|                                      | 00:45 | 75.8 | 53.3 | 41.3 |
|                                      | 01:00 | 66.8 | 50.1 | 40.2 |
|                                      | 01:15 | 65.6 | 49.4 | 40.3 |
|                                      | 01:30 | 72.7 | 47.6 | 39.2 |
|                                      | 01:45 | 66.3 | 49.1 | 38.7 |
|                                      | 02:00 | 69.7 | 46.7 | 38.3 |
|                                      | 02:15 | 53.8 | 42.1 | 37.4 |
|                                      | 02:30 | 67.0 | 46.3 | 37.6 |
|                                      | 02:45 | 63.9 | 46.5 | 38.2 |
|                                      | 03:00 | 68.2 | 46.9 | 38.5 |
|                                      | 03:15 | 65.5 | 46.3 | 36.7 |
|                                      | 03:30 | 59.7 | 42.5 | 36.4 |
|                                      | 03:45 | 61.7 | 44.8 | 37.0 |
|                                      | 04:00 | 63.2 | 45.4 | 36.6 |
|                                      | 04:15 | 62.4 | 45.5 | 36.8 |
|                                      | 04:30 | 59.3 | 42.9 | 36.3 |
|                                      | 04:45 | 64.4 | 46.7 | 36.5 |
|                                      | 05:00 | 63.6 | 45.3 | 36.5 |
|                                      | 05:15 | 56.3 | 42.4 | 36.8 |
|                                      | 05:30 | 63.5 | 47.7 | 37.4 |
|                                      | 05:45 | 60.4 | 44.9 | 37.3 |
|                                      | 06:00 | 63.4 | 48.2 | 40.2 |
|                                      | 06:15 | 67.7 | 50.5 | 40.8 |
|                                      | 06:30 | 68.6 | 47.9 | 40.9 |
|                                      | 06:45 | 65.4 | 48.6 | 42.3 |
|                                      | 07:00 | 64.0 | 49.7 | 41.6 |
|                                      | 07:15 | 65.6 | 49.5 | 41.3 |

|  |       |      |      |      |
|--|-------|------|------|------|
|  | 07:30 | 66.3 | 50.1 | 42.5 |
|  | 07:45 | 70.2 | 53.0 | 43.0 |
|  | 08:00 | 66.8 | 50.7 | 41.9 |
|  | 08:15 | 66.3 | 49.4 | 43.3 |
|  | 08:30 | 69.9 | 53.0 | 44.4 |
|  | 08:45 | 66.0 | 52.4 | 44.5 |
|  | 09:00 | 70.9 | 52.0 | 44.6 |
|  | 09:15 | 64.5 | 52.3 | 44.4 |
|  | 09:30 | 66.7 | 53.3 | 46.1 |
|  | 09:45 | 68.4 | 55.6 | 47.0 |
|  | 10:00 | 72.1 | 55.5 | 47.0 |
|  | 10:15 | 85.2 | 55.4 | 47.2 |
|  | 10:30 | 76.5 | 57.1 | 49.2 |
|  | 10:45 | 69.1 | 56.6 | 49.1 |
|  | 11:00 | 72.8 | 57.1 | 48.1 |
|  | 11:15 | 71.1 | 58.8 | 50.0 |
|  | 11:30 | 69.5 | 57.4 | 50.8 |
|  | 11:45 | 71.1 | 58.9 | 51.5 |
|  | 12:00 | 82.9 | 60.5 | 52.8 |
|  | 12:15 | 74.8 | 60.5 | 52.8 |
|  | 12:30 | 82.2 | 64.5 | 52.3 |
|  | 12:45 | 81.4 | 60.8 | 51.7 |
|  | 13:00 | 73.0 | 60.2 | 52.4 |
|  | 13:15 | 73.6 | 60.3 | 53.2 |
|  | 13:30 | 70.8 | 60.2 | 52.8 |
|  | 13:45 | 73.1 | 60.8 | 52.3 |
|  | 14:00 | 81.4 | 59.5 | 50.4 |
|  | 14:15 | 73.8 | 61.2 | 51.2 |
|  | 14:30 | 69.7 | 59.2 | 50.5 |
|  | 14:45 | 79.2 | 59.3 | 50.6 |

|  |       |      |      |      |
|--|-------|------|------|------|
|  | 15:00 | 69.7 | 59.6 | 50.8 |
|  | 15:15 | 86.7 | 60.4 | 50.6 |
|  | 15:30 | 71.1 | 59.3 | 50.1 |
|  | 15:45 | 74.9 | 58.4 | 49.1 |
|  | 16:00 | 71.2 | 58.8 | 50.8 |
|  | 16:15 | 72.9 | 58.8 | 50.5 |
|  | 16:30 | 74.9 | 60.1 | 51.5 |
|  | 16:45 | 73.3 | 59.0 | 52.3 |
|  | 17:00 | 72.9 | 57.7 | 49.1 |
|  | 17:15 | 75.6 | 58.7 | 49.2 |
|  | 17:30 | 79.7 | 58.5 | 48.6 |
|  | 17:45 | 72.2 | 56.2 | 48.1 |
|  | 18:00 | 69.4 | 56.9 | 48.6 |
|  | 18:15 | 71.1 | 56.8 | 47.7 |
|  | 18:30 | 70.7 | 57.3 | 48.1 |
|  | 18:45 | 72.2 | 57.3 | 47.9 |
|  | 19:00 | 73.2 | 56.6 | 47.5 |
|  | 19:15 | 81.3 | 57.2 | 47.1 |
|  | 19:30 | 73.0 | 54.9 | 46.5 |
|  | 19:45 | 74.1 | 58.0 | 47.9 |
|  | 20:00 | 69.6 | 55.2 | 46.6 |
|  | 20:15 | 71.5 | 55.4 | 45.7 |
|  | 20:30 | 69.1 | 53.8 | 44.7 |
|  | 20:45 | 72.5 | 54.1 | 44.8 |
|  | 21:00 | 69.6 | 54.1 | 44.3 |
|  | 21:15 | 70.1 | 56.7 | 44.8 |
|  | 21:30 | 66.7 | 53.6 | 44.6 |
|  | 21:45 | 71.0 | 53.7 | 44.2 |
|  | 22:00 | 67.8 | 52.9 | 44.8 |
|  | 22:15 | 71.2 | 51.8 | 44.9 |

|                                      |       |      |      |      |
|--------------------------------------|-------|------|------|------|
|                                      | 22:30 | 68.5 | 56.0 | 46.2 |
|                                      | 22:45 | 68.2 | 55.5 | 48.4 |
|                                      | 23:00 | 67.0 | 54.5 | 50.3 |
|                                      | 23:15 | 69.6 | 54.7 | 48.6 |
|                                      | 23:30 | 69.9 | 54.6 | 47.0 |
|                                      | 23:45 | 69.8 | 54.6 | 45.6 |
| Monday 27 <sup>th</sup> January 2025 | 00:00 | 58.5 | 48.3 | 45.6 |
|                                      | 00:15 | 67.9 | 51.9 | 47.0 |
|                                      | 00:30 | 68.0 | 49.8 | 42.0 |
|                                      | 00:45 | 66.5 | 48.8 | 40.9 |
|                                      | 01:00 | 69.4 | 52.5 | 42.5 |
|                                      | 01:15 | 65.5 | 50.9 | 43.6 |
|                                      | 01:30 | 70.2 | 51.6 | 42.3 |
|                                      | 01:45 | 60.9 | 45.8 | 40.9 |
|                                      | 02:00 | 58.9 | 45.1 | 39.8 |
|                                      | 02:15 | 66.2 | 48.8 | 40.2 |
|                                      | 02:30 | 61.2 | 44.7 | 40.2 |
|                                      | 02:45 | 59.1 | 44.4 | 39.8 |
|                                      | 03:00 | 57.3 | 44.2 | 38.7 |
|                                      | 03:15 | 69.1 | 47.6 | 38.4 |
|                                      | 03:30 | 61.4 | 44.4 | 38.5 |
|                                      | 03:45 | 59.1 | 44.6 | 39.2 |
|                                      | 04:00 | 57.1 | 45.3 | 40.2 |
|                                      | 04:15 | 59.3 | 46.6 | 40.4 |
|                                      | 04:30 | 72.9 | 52.1 | 42.5 |
|                                      | 04:45 | 65.5 | 49.2 | 42.3 |
|                                      | 05:00 | 63.3 | 46.8 | 41.2 |
|                                      | 05:15 | 70.5 | 48.4 | 42.9 |
|                                      | 05:30 | 69.8 | 52.7 | 45.4 |
|                                      | 05:45 | 63.4 | 50.6 | 44.9 |

|                                         |       |      |      |      |
|-----------------------------------------|-------|------|------|------|
|                                         | 06:00 | 65.3 | 51.6 | 46.8 |
|                                         | 06:15 | 67.2 | 54.1 | 48.4 |
|                                         | 06:30 | 77.6 | 55.9 | 48.4 |
|                                         | 06:45 | 67.9 | 55.2 | 49.2 |
|                                         | 07:00 | 65.4 | 54.9 | 49.6 |
|                                         | 07:15 | 72.8 | 58.1 | 50.2 |
|                                         | 07:30 | 77.5 | 59.5 | 51.8 |
|                                         | 07:45 | 68.8 | 58.3 | 52.5 |
|                                         | 08:00 | 72.9 | 58.1 | 55.5 |
|                                         | 08:15 | 72.3 | 58.5 | 55.8 |
|                                         | 08:30 | 81.1 | 64.3 | 54.7 |
|                                         | 08:45 | 71.0 | 60.3 | 52.6 |
|                                         | 09:00 | 69.1 | 59.0 | 50.7 |
|                                         | 09:15 | 73.2 | 59.6 | 51.4 |
|                                         | 09:30 | 81.3 | 58.2 | 50.8 |
|                                         | 09:45 | 71.1 | 58.9 | 51.2 |
|                                         | 10:00 | 69.1 | 58.1 | 50.8 |
|                                         | 10:15 | 86.9 | 58.1 | 49.6 |
|                                         | 10:30 | 69.7 | 57.1 | 48.9 |
|                                         | 10:45 | 70.6 | 57.6 | 51.0 |
|                                         | 11:00 | 73.5 | 56.5 | 50.8 |
|                                         | 11:15 | 71.4 | 57.3 | 50.4 |
|                                         | 11:30 | 73.7 | 60.6 | 52.4 |
| Table 2.1: Measured Noise Levels at LT1 |       |      |      |      |

| Date of Meas.                          | Start Time | Measured Façade Sound Levels, dB |                      |                        |
|----------------------------------------|------------|----------------------------------|----------------------|------------------------|
|                                        |            | L <sub>Amax,F</sub>              | L <sub>Aeq,8hr</sub> | L <sub>A90,15min</sub> |
| Thursday 23 <sup>rd</sup> January 2025 | 13:30      | 73.8                             | 56.5                 | 53.3                   |
|                                        | 13:45      | 73.3                             | 58.1                 | 54.3                   |
|                                        | 14:00      | 77.3                             | 59.7                 | 55.7                   |
|                                        | 14:15      | 73.6                             | 58.5                 | 55.4                   |
|                                        | 14:30      | 83.0                             | 56.2                 | 50.9                   |
|                                        | 14:45      | 70.5                             | 53.7                 | 50.2                   |
|                                        | 15:00      | 67.1                             | 53.7                 | 49.1                   |
|                                        | 15:15      | 62.0                             | 51.9                 | 49.0                   |
|                                        | 15:30      | 62.9                             | 51.5                 | 48.9                   |
|                                        | 15:45      | 63.5                             | 51.7                 | 49.2                   |
|                                        | 16:00      | 66.7                             | 52.9                 | 50.7                   |
|                                        | 16:15      | 70.6                             | 55.9                 | 52.1                   |
|                                        | 16:30      | 62.0                             | 52.2                 | 50.2                   |
|                                        | 16:45      | 70.5                             | 53.2                 | 49.8                   |
|                                        | 17:00      | 71.2                             | 55.0                 | 50.4                   |
|                                        | 17:15      | 64.0                             | 51.5                 | 49.5                   |
|                                        | 17:30      | 62.4                             | 52.0                 | 49.5                   |
|                                        | 17:45      | 64.7                             | 51.0                 | 49.0                   |
|                                        | 18:00      | 60.3                             | 51.7                 | 49.2                   |
|                                        | 18:15      | 63.7                             | 51.2                 | 49.5                   |
|                                        | 18:30      | 61.8                             | 51.1                 | 49.3                   |
|                                        | 18:45      | 70.8                             | 54.6                 | 50.1                   |
|                                        | 19:00      | 69.6                             | 53.2                 | 49.8                   |
|                                        | 19:15      | 75.3                             | 53.9                 | 49.2                   |
|                                        | 19:30      | 71.4                             | 53.3                 | 49.6                   |
|                                        | 19:45      | 64.1                             | 50.5                 | 48.8                   |
|                                        | 20:00      | 63.9                             | 50.8                 | 48.9                   |

|                                      |       |      |      |      |
|--------------------------------------|-------|------|------|------|
|                                      | 20:15 | 54.6 | 50.2 | 48.7 |
|                                      | 20:30 | 62.1 | 50.9 | 49.2 |
|                                      | 20:45 | 70.8 | 51.6 | 48.9 |
|                                      | 21:00 | 64.5 | 51.6 | 49.4 |
|                                      | 21:15 | 66.9 | 50.8 | 48.7 |
|                                      | 21:30 | 56.4 | 50.3 | 48.7 |
|                                      | 21:45 | 61.7 | 51.0 | 48.8 |
|                                      | 22:00 | 61.4 | 49.5 | 47.3 |
|                                      | 22:15 | 58.3 | 49.1 | 47.0 |
|                                      | 22:30 | 65.3 | 49.1 | 47.1 |
|                                      | 22:45 | 61.6 | 48.9 | 47.1 |
|                                      | 23:00 | 62.5 | 50.0 | 47.2 |
|                                      | 23:15 | 59.2 | 48.6 | 46.2 |
|                                      | 23:30 | 56.5 | 47.2 | 45.3 |
|                                      | 23:45 | 63.8 | 48.0 | 45.2 |
| Friday 24 <sup>th</sup> January 2025 | 00:00 | 58.3 | 47.1 | 45.1 |
|                                      | 00:15 | 60.4 | 47.5 | 45.2 |
|                                      | 00:30 | 62.4 | 47.7 | 44.9 |
|                                      | 00:45 | 57.6 | 48.1 | 44.9 |
|                                      | 01:00 | 58.8 | 48.2 | 45.6 |
|                                      | 01:15 | 66.9 | 47.4 | 44.4 |
|                                      | 01:30 | 62.9 | 47.0 | 42.7 |
|                                      | 01:45 | 58.7 | 47.5 | 42.8 |
|                                      | 02:00 | 57.8 | 48.3 | 42.2 |
|                                      | 02:15 | 67.2 | 47.9 | 43.3 |
|                                      | 02:30 | 60.4 | 45.9 | 42.5 |
|                                      | 02:45 | 59.9 | 45.6 | 42.6 |
|                                      | 03:00 | 66.4 | 49.5 | 43.7 |
|                                      | 03:15 | 76.5 | 53.4 | 45.8 |
|                                      | 03:30 | 77.5 | 54.1 | 45.6 |

|  |       |      |      |      |
|--|-------|------|------|------|
|  | 03:45 | 79.7 | 56.6 | 47.3 |
|  | 04:00 | 81.1 | 57.3 | 48.4 |
|  | 04:15 | 81.8 | 59.4 | 48.5 |
|  | 04:30 | 79.4 | 56.7 | 49.5 |
|  | 04:45 | 82.3 | 58.8 | 49.4 |
|  | 05:00 | 79.6 | 60.0 | 50.0 |
|  | 05:15 | 78.2 | 56.7 | 49.0 |
|  | 05:30 | 76.7 | 56.8 | 49.7 |
|  | 05:45 | 75.5 | 57.2 | 49.5 |
|  | 06:00 | 73.6 | 55.8 | 48.3 |
|  | 06:15 | 88.0 | 55.9 | 48.7 |
|  | 06:30 | 74.6 | 55.4 | 49.8 |
|  | 06:45 | 76.5 | 55.4 | 49.4 |
|  | 07:00 | 79.0 | 58.0 | 50.1 |
|  | 07:15 | 73.4 | 56.2 | 50.6 |
|  | 07:30 | 72.0 | 55.9 | 51.0 |
|  | 07:45 | 86.0 | 62.1 | 51.9 |
|  | 08:00 | 74.6 | 56.6 | 52.2 |
|  | 08:15 | 74.6 | 56.2 | 52.0 |
|  | 08:30 | 76.5 | 56.5 | 52.3 |
|  | 08:45 | 71.3 | 54.5 | 52.1 |
|  | 09:00 | 71.1 | 54.6 | 51.0 |
|  | 09:15 | 66.0 | 53.9 | 51.2 |
|  | 09:30 | 69.3 | 55.1 | 51.5 |
|  | 09:45 | 68.4 | 53.2 | 50.2 |
|  | 10:00 | 68.1 | 55.0 | 50.1 |
|  | 10:15 | 66.4 | 51.9 | 49.7 |
|  | 10:30 | 71.8 | 53.0 | 49.6 |
|  | 10:45 | 71.0 | 55.1 | 49.7 |
|  | 11:00 | 65.4 | 52.4 | 49.3 |

|  |       |      |      |      |
|--|-------|------|------|------|
|  | 11:15 | 69.4 | 53.1 | 49.7 |
|  | 11:30 | 67.9 | 53.8 | 49.9 |
|  | 11:45 | 65.8 | 55.4 | 50.1 |
|  | 12:00 | 70.8 | 57.5 | 51.4 |
|  | 12:15 | 69.0 | 54.0 | 49.9 |
|  | 12:30 | 76.5 | 58.9 | 51.3 |
|  | 12:45 | 79.6 | 59.3 | 51.4 |
|  | 13:00 | 69.6 | 54.8 | 49.9 |
|  | 13:15 | 69.0 | 56.2 | 52.5 |
|  | 13:30 | 77.2 | 59.8 | 54.3 |
|  | 13:45 | 75.7 | 59.2 | 53.2 |
|  | 14:00 | 70.9 | 55.0 | 49.7 |
|  | 14:15 | 71.4 | 53.1 | 49.5 |
|  | 14:30 | 71.7 | 53.2 | 49.0 |
|  | 14:45 | 71.9 | 52.8 | 49.0 |
|  | 15:00 | 66.6 | 53.5 | 49.5 |
|  | 15:15 | 71.6 | 52.3 | 48.6 |
|  | 15:30 | 66.8 | 52.2 | 48.6 |
|  | 15:45 | 68.6 | 54.3 | 49.4 |
|  | 16:00 | 66.1 | 52.1 | 49.4 |
|  | 16:15 | 67.0 | 55.0 | 50.8 |
|  | 16:30 | 62.7 | 51.5 | 48.7 |
|  | 16:45 | 75.1 | 54.1 | 48.3 |
|  | 17:00 | 66.5 | 51.3 | 47.8 |
|  | 17:15 | 61.3 | 50.4 | 47.3 |
|  | 17:30 | 67.8 | 52.4 | 47.6 |
|  | 17:45 | 64.4 | 50.8 | 47.4 |
|  | 18:00 | 64.1 | 51.4 | 48.8 |
|  | 18:15 | 61.6 | 51.5 | 48.7 |
|  | 18:30 | 59.9 | 51.5 | 48.9 |

|                                        |       |      |      |      |
|----------------------------------------|-------|------|------|------|
|                                        | 18:45 | 62.7 | 51.5 | 48.8 |
|                                        | 19:00 | 57.9 | 51.7 | 49.1 |
|                                        | 19:15 | 63.2 | 50.5 | 48.5 |
|                                        | 19:30 | 68.5 | 52.3 | 48.3 |
|                                        | 19:45 | 67.8 | 52.2 | 48.6 |
|                                        | 20:00 | 64.6 | 51.4 | 48.7 |
|                                        | 20:15 | 61.3 | 50.8 | 49.2 |
|                                        | 20:30 | 63.0 | 50.9 | 48.6 |
|                                        | 20:45 | 60.0 | 51.2 | 48.5 |
|                                        | 21:00 | 63.5 | 51.2 | 48.8 |
|                                        | 21:15 | 61.1 | 50.1 | 48.5 |
|                                        | 21:30 | 77.5 | 52.2 | 48.5 |
|                                        | 21:45 | 70.4 | 50.8 | 47.6 |
|                                        | 22:00 | 65.4 | 51.7 | 47.6 |
|                                        | 22:15 | 59.7 | 50.0 | 47.4 |
|                                        | 22:30 | 70.8 | 52.6 | 48.0 |
|                                        | 22:45 | 59.4 | 49.2 | 47.1 |
|                                        | 23:00 | 56.6 | 49.6 | 47.4 |
|                                        | 23:15 | 70.9 | 51.4 | 47.3 |
|                                        | 23:30 | 75.8 | 53.8 | 46.1 |
|                                        | 23:45 | 58.7 | 49.4 | 45.3 |
| Saturday 25 <sup>th</sup> January 2025 | 00:00 | 63.9 | 49.9 | 45.5 |
|                                        | 00:15 | 58.0 | 47.6 | 45.2 |
|                                        | 00:30 | 64.3 | 50.1 | 44.6 |
|                                        | 00:45 | 52.3 | 46.1 | 43.7 |
|                                        | 01:00 | 58.1 | 49.0 | 43.7 |
|                                        | 01:15 | 61.5 | 48.8 | 43.1 |
|                                        | 01:30 | 74.0 | 50.0 | 42.6 |
|                                        | 01:45 | 57.4 | 47.8 | 41.7 |
|                                        | 02:00 | 60.8 | 47.9 | 41.6 |

|  |       |      |      |      |
|--|-------|------|------|------|
|  | 02:15 | 56.0 | 45.2 | 41.7 |
|  | 02:30 | 58.4 | 48.0 | 40.9 |
|  | 02:45 | 58.2 | 48.7 | 41.1 |
|  | 03:00 | 64.7 | 46.4 | 39.9 |
|  | 03:15 | 57.5 | 44.8 | 38.6 |
|  | 03:30 | 56.9 | 42.9 | 37.1 |
|  | 03:45 | 58.6 | 46.5 | 37.8 |
|  | 04:00 | 55.8 | 41.3 | 37.1 |
|  | 04:15 | 59.0 | 46.6 | 38.5 |
|  | 04:30 | 52.5 | 40.9 | 37.0 |
|  | 04:45 | 61.2 | 46.8 | 36.6 |
|  | 05:00 | 58.3 | 42.6 | 36.5 |
|  | 05:15 | 61.0 | 45.7 | 36.0 |
|  | 05:30 | 56.1 | 42.0 | 37.5 |
|  | 05:45 | 52.3 | 41.6 | 38.0 |
|  | 06:00 | 64.0 | 43.6 | 37.7 |
|  | 06:15 | 53.1 | 42.0 | 38.8 |
|  | 06:30 | 60.4 | 46.5 | 38.8 |
|  | 06:45 | 56.7 | 43.9 | 39.8 |
|  | 07:00 | 61.3 | 46.2 | 39.6 |
|  | 07:15 | 61.7 | 45.5 | 40.6 |
|  | 07:30 | 56.9 | 44.6 | 41.0 |
|  | 07:45 | 59.4 | 46.7 | 42.1 |
|  | 08:00 | 52.4 | 45.1 | 42.3 |
|  | 08:15 | 63.7 | 47.2 | 43.4 |
|  | 08:30 | 60.3 | 47.1 | 44.8 |
|  | 08:45 | 62.5 | 49.4 | 45.8 |
|  | 09:00 | 65.6 | 49.0 | 45.9 |
|  | 09:15 | 69.6 | 50.1 | 45.7 |
|  | 09:30 | 59.1 | 48.3 | 45.6 |

|  |       |      |      |      |
|--|-------|------|------|------|
|  | 09:45 | 61.7 | 49.7 | 46.6 |
|  | 10:00 | 69.6 | 50.1 | 45.8 |
|  | 10:15 | 63.4 | 49.2 | 44.9 |
|  | 10:30 | 72.8 | 51.0 | 45.9 |
|  | 10:45 | 70.7 | 50.2 | 45.9 |
|  | 11:00 | 70.7 | 52.2 | 46.8 |
|  | 11:15 | 60.3 | 51.4 | 46.2 |
|  | 11:30 | 67.0 | 51.1 | 46.2 |
|  | 11:45 | 63.2 | 50.5 | 46.3 |
|  | 12:00 | 61.6 | 50.3 | 44.8 |
|  | 12:15 | 64.7 | 50.1 | 44.3 |
|  | 12:30 | 71.7 | 52.8 | 44.7 |
|  | 12:45 | 65.4 | 50.3 | 44.8 |
|  | 13:00 | 64.8 | 50.1 | 45.6 |
|  | 13:15 | 61.5 | 49.9 | 44.9 |
|  | 13:30 | 67.8 | 50.1 | 45.0 |
|  | 13:45 | 61.8 | 49.7 | 44.1 |
|  | 14:00 | 69.8 | 52.1 | 44.9 |
|  | 14:15 | 72.5 | 53.8 | 44.7 |
|  | 14:30 | 66.4 | 51.3 | 44.2 |
|  | 14:45 | 64.9 | 49.6 | 44.2 |
|  | 15:00 | 66.7 | 50.9 | 43.6 |
|  | 15:15 | 63.7 | 49.3 | 44.8 |
|  | 15:30 | 65.3 | 52.1 | 45.1 |
|  | 15:45 | 80.8 | 52.2 | 44.7 |
|  | 16:00 | 62.6 | 48.7 | 44.9 |
|  | 16:15 | 62.4 | 50.5 | 45.3 |
|  | 16:30 | 59.3 | 48.9 | 44.7 |
|  | 16:45 | 62.1 | 47.4 | 44.7 |
|  | 17:00 | 69.6 | 50.8 | 46.3 |

|                                      |       |      |      |      |
|--------------------------------------|-------|------|------|------|
|                                      | 17:15 | 60.5 | 50.1 | 46.2 |
|                                      | 17:30 | 61.7 | 47.9 | 45.2 |
|                                      | 17:45 | 64.3 | 50.1 | 45.4 |
|                                      | 18:00 | 54.9 | 48.0 | 46.1 |
|                                      | 18:15 | 60.3 | 49.2 | 46.7 |
|                                      | 18:30 | 59.0 | 50.1 | 46.9 |
|                                      | 18:45 | 60.6 | 49.0 | 47.0 |
|                                      | 19:00 | 61.7 | 49.1 | 47.0 |
|                                      | 19:15 | 63.3 | 50.4 | 47.1 |
|                                      | 19:30 | 55.7 | 48.9 | 47.1 |
|                                      | 19:45 | 62.0 | 48.8 | 46.6 |
|                                      | 20:00 | 57.0 | 48.9 | 46.6 |
|                                      | 20:15 | 56.2 | 49.0 | 46.5 |
|                                      | 20:30 | 60.3 | 49.7 | 46.7 |
|                                      | 20:45 | 70.3 | 49.1 | 46.3 |
|                                      | 21:00 | 58.7 | 47.9 | 45.9 |
|                                      | 21:15 | 60.8 | 48.8 | 46.3 |
|                                      | 21:30 | 63.5 | 49.1 | 45.6 |
|                                      | 21:45 | 54.2 | 47.8 | 45.8 |
|                                      | 22:00 | 74.4 | 50.3 | 46.2 |
|                                      | 22:15 | 61.9 | 48.8 | 46.6 |
|                                      | 22:30 | 61.1 | 48.6 | 46.3 |
|                                      | 22:45 | 61.1 | 48.8 | 46.5 |
|                                      | 23:00 | 53.8 | 48.3 | 45.8 |
|                                      | 23:15 | 61.3 | 49.5 | 46.7 |
|                                      | 23:30 | 60.9 | 48.3 | 46.2 |
|                                      | 23:45 | 77.6 | 56.4 | 46.2 |
| Sunday 26 <sup>th</sup> January 2025 | 00:00 | 76.0 | 55.1 | 46.3 |
|                                      | 00:15 | 61.9 | 48.9 | 46.6 |
|                                      | 00:30 | 71.2 | 50.0 | 46.7 |

|  |       |      |      |      |
|--|-------|------|------|------|
|  | 00:45 | 62.4 | 48.5 | 46.7 |
|  | 01:00 | 63.9 | 48.6 | 46.3 |
|  | 01:15 | 53.5 | 47.0 | 44.9 |
|  | 01:30 | 55.0 | 47.2 | 44.9 |
|  | 01:45 | 68.7 | 50.6 | 44.5 |
|  | 02:00 | 60.6 | 46.8 | 43.9 |
|  | 02:15 | 54.7 | 46.6 | 44.0 |
|  | 02:30 | 55.7 | 46.2 | 43.6 |
|  | 02:45 | 52.1 | 45.8 | 42.9 |
|  | 03:00 | 71.6 | 49.2 | 42.7 |
|  | 03:15 | 52.3 | 44.8 | 42.6 |
|  | 03:30 | 51.7 | 44.4 | 41.9 |
|  | 03:45 | 55.2 | 44.7 | 42.7 |
|  | 04:00 | 52.1 | 45.0 | 42.4 |
|  | 04:15 | 53.8 | 44.4 | 42.0 |
|  | 04:30 | 51.9 | 44.7 | 42.4 |
|  | 04:45 | 60.2 | 45.5 | 42.0 |
|  | 05:00 | 51.7 | 44.8 | 42.8 |
|  | 05:15 | 62.0 | 46.0 | 42.1 |
|  | 05:30 | 51.5 | 43.5 | 41.3 |
|  | 05:45 | 52.2 | 43.8 | 41.6 |
|  | 06:00 | 50.0 | 43.6 | 41.5 |
|  | 06:15 | 63.3 | 45.8 | 42.5 |
|  | 06:30 | 53.9 | 46.1 | 43.7 |
|  | 06:45 | 53.4 | 45.4 | 42.9 |
|  | 07:00 | 69.4 | 51.0 | 44.5 |
|  | 07:15 | 67.3 | 50.9 | 44.3 |
|  | 07:30 | 66.7 | 50.4 | 44.7 |
|  | 07:45 | 67.9 | 51.1 | 46.0 |
|  | 08:00 | 60.0 | 48.2 | 45.1 |

|  |       |      |      |      |
|--|-------|------|------|------|
|  | 08:15 | 65.2 | 50.3 | 46.1 |
|  | 08:30 | 59.5 | 48.8 | 46.5 |
|  | 08:45 | 59.2 | 49.5 | 46.8 |
|  | 09:00 | 64.6 | 49.7 | 46.6 |
|  | 09:15 | 62.8 | 50.7 | 47.1 |
|  | 09:30 | 68.4 | 51.8 | 48.6 |
|  | 09:45 | 63.4 | 51.7 | 48.4 |
|  | 10:00 | 65.4 | 51.0 | 48.2 |
|  | 10:15 | 70.7 | 57.3 | 49.0 |
|  | 10:30 | 66.8 | 52.4 | 49.7 |
|  | 10:45 | 67.3 | 54.4 | 50.3 |
|  | 11:00 | 72.7 | 54.5 | 50.0 |
|  | 11:15 | 73.7 | 54.1 | 50.6 |
|  | 11:30 | 70.9 | 56.0 | 51.0 |
|  | 11:45 | 72.3 | 55.0 | 51.3 |
|  | 12:00 | 68.5 | 55.0 | 50.9 |
|  | 12:15 | 71.8 | 56.4 | 52.6 |
|  | 12:30 | 68.5 | 56.6 | 53.4 |
|  | 12:45 | 74.9 | 58.5 | 54.7 |
|  | 13:00 | 73.9 | 58.2 | 54.0 |
|  | 13:15 | 72.6 | 59.4 | 54.7 |
|  | 13:30 | 70.5 | 59.6 | 54.1 |
|  | 13:45 | 69.5 | 56.5 | 53.7 |
|  | 14:00 | 71.9 | 56.6 | 53.3 |
|  | 14:15 | 79.3 | 59.1 | 53.8 |
|  | 14:30 | 80.5 | 58.1 | 54.2 |
|  | 14:45 | 74.6 | 57.3 | 54.0 |
|  | 15:00 | 75.5 | 57.6 | 54.0 |
|  | 15:15 | 81.6 | 61.6 | 54.0 |
|  | 15:30 | 67.7 | 56.2 | 53.8 |

|  |       |      |      |      |
|--|-------|------|------|------|
|  | 15:45 | 71.0 | 57.0 | 53.2 |
|  | 16:00 | 67.4 | 55.4 | 53.0 |
|  | 16:15 | 72.7 | 55.1 | 52.3 |
|  | 16:30 | 76.7 | 56.7 | 52.2 |
|  | 16:45 | 66.0 | 54.0 | 51.6 |
|  | 17:00 | 76.5 | 57.1 | 52.5 |
|  | 17:15 | 73.5 | 55.1 | 52.4 |
|  | 17:30 | 67.2 | 53.6 | 51.3 |
|  | 17:45 | 75.0 | 55.8 | 51.1 |
|  | 18:00 | 59.6 | 52.6 | 50.7 |
|  | 18:15 | 65.1 | 52.3 | 50.2 |
|  | 18:30 | 64.4 | 52.6 | 50.3 |
|  | 18:45 | 65.2 | 52.3 | 49.9 |
|  | 19:00 | 69.2 | 52.7 | 50.0 |
|  | 19:15 | 63.6 | 52.0 | 49.4 |
|  | 19:30 | 68.6 | 52.8 | 48.6 |
|  | 19:45 | 65.1 | 51.7 | 48.8 |
|  | 20:00 | 65.5 | 51.0 | 48.2 |
|  | 20:15 | 62.0 | 51.7 | 48.9 |
|  | 20:30 | 61.4 | 50.8 | 48.6 |
|  | 20:45 | 65.0 | 51.1 | 48.6 |
|  | 21:00 | 59.2 | 51.7 | 48.6 |
|  | 21:15 | 65.0 | 51.0 | 48.5 |
|  | 21:30 | 59.5 | 50.9 | 47.7 |
|  | 21:45 | 58.5 | 51.2 | 48.3 |
|  | 22:00 | 78.0 | 56.7 | 48.8 |
|  | 22:15 | 59.2 | 51.7 | 48.7 |
|  | 22:30 | 59.3 | 51.5 | 47.6 |
|  | 22:45 | 62.3 | 51.5 | 47.7 |
|  | 23:00 | 74.0 | 54.0 | 48.6 |

|                                      |       |      |      |      |
|--------------------------------------|-------|------|------|------|
|                                      | 23:15 | 66.6 | 51.0 | 48.3 |
|                                      | 23:30 | 62.8 | 51.4 | 48.4 |
|                                      | 23:45 | 63.5 | 52.5 | 50.3 |
| Monday 27 <sup>th</sup> January 2025 | 00:00 | 67.9 | 54.0 | 52.1 |
|                                      | 00:15 | 64.3 | 51.9 | 50.4 |
|                                      | 00:30 | 65.3 | 50.8 | 48.3 |
|                                      | 00:45 | 64.7 | 50.1 | 47.7 |
|                                      | 01:00 | 58.0 | 49.5 | 47.4 |
|                                      | 01:15 | 59.7 | 50.7 | 49.1 |
|                                      | 01:30 | 64.4 | 49.1 | 45.9 |
|                                      | 01:45 | 63.4 | 48.4 | 44.7 |
|                                      | 02:00 | 70.2 | 51.0 | 42.7 |
|                                      | 02:15 | 62.6 | 46.1 | 41.4 |
|                                      | 02:30 | 52.2 | 43.4 | 40.7 |
|                                      | 02:45 | 58.9 | 45.0 | 39.2 |
|                                      | 03:00 | 58.9 | 46.3 | 40.1 |
|                                      | 03:15 | 60.1 | 44.0 | 40.2 |
|                                      | 03:30 | 54.2 | 43.6 | 40.1 |
|                                      | 03:45 | 61.6 | 44.5 | 41.0 |
|                                      | 04:00 | 57.0 | 43.3 | 40.0 |
|                                      | 04:15 | 68.3 | 45.1 | 40.7 |
|                                      | 04:30 | 64.5 | 45.7 | 40.8 |
|                                      | 04:45 | 57.5 | 44.7 | 41.1 |
|                                      | 05:00 | 60.2 | 44.5 | 41.0 |
|                                      | 05:15 | 59.7 | 44.6 | 41.4 |
|                                      | 05:30 | 62.4 | 46.0 | 43.1 |
|                                      | 05:45 | 60.5 | 46.6 | 43.6 |
|                                      | 06:00 | 54.7 | 46.2 | 44.1 |
|                                      | 06:15 | 65.2 | 48.5 | 45.2 |
|                                      | 06:30 | 62.3 | 50.0 | 47.2 |

|                                                |       |      |      |      |
|------------------------------------------------|-------|------|------|------|
|                                                | 06:45 | 65.1 | 51.5 | 47.2 |
|                                                | 07:00 | 56.0 | 49.9 | 47.6 |
|                                                | 07:15 | 60.4 | 51.9 | 48.9 |
|                                                | 07:30 | 62.9 | 51.3 | 49.3 |
|                                                | 07:45 | 60.4 | 52.1 | 50.0 |
|                                                | 08:00 | 69.6 | 52.8 | 50.6 |
|                                                | 08:15 | 64.6 | 53.2 | 51.3 |
|                                                | 08:30 | 75.5 | 55.1 | 52.5 |
|                                                | 08:45 | 78.0 | 57.6 | 52.4 |
|                                                | 09:00 | 72.9 | 54.6 | 51.8 |
|                                                | 09:15 | 72.2 | 56.5 | 52.4 |
|                                                | 09:30 | 80.0 | 60.6 | 54.5 |
|                                                | 09:45 | 69.7 | 56.5 | 53.8 |
|                                                | 10:00 | 63.8 | 54.6 | 52.7 |
|                                                | 10:15 | 67.2 | 54.8 | 52.2 |
|                                                | 10:30 | 66.9 | 54.2 | 52.0 |
|                                                | 10:45 | 70.9 | 56.2 | 52.0 |
|                                                | 11:00 | 66.0 | 54.0 | 51.2 |
|                                                | 11:15 | 70.7 | 54.5 | 51.3 |
|                                                | 11:30 | 64.7 | 53.6 | 51.2 |
|                                                | 11:45 | 79.5 | 58.7 | 53.9 |
|                                                | 12:00 | 75.4 | 59.8 | 53.3 |
|                                                | 12:15 | 82.0 | 61.4 | 52.8 |
| <b>Table 2.2:</b> Measured Noise Levels at LT2 |       |      |      |      |