

## **NOISE IMPACT ASSESSMENT**

**77 – 79 MOSLEY STREET, MANCHESTER**

REPORT REFERENCE NO. J004287-6015-DH-08

AUGUST 2024

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## Document Control Sheet

| Details of Assessment |                                                           |
|-----------------------|-----------------------------------------------------------|
| Client                | Biz Assets Ltd                                            |
| Document Title        | Noise Impact Assessment – 77-79 Mosley Street, Manchester |
| Report Reference      | J004287-6015-DH-07                                        |

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| 08    | 07/08/2024 | David Hible BA(Hons) AMIOA | Appended Raw Survey Data                                  | Current |

|             | Name                       | Position             |
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*This report has been prepared based upon a scope of works and associated resources agreed between the client and Philip Dunbavin Acoustics Ltd (PDA). This report has been prepared with all reasonable skill, care and diligence and has been based upon the interpretation of data collected. This has been accepted in good*



*faith as being accurate and valid at the time of the collection. This report has been based solely on the specific design assumptions and criteria stated herein.*

## CONTENTS

|       |                                                                              |    |
|-------|------------------------------------------------------------------------------|----|
| 1.0   | SUMMARY.....                                                                 | 5  |
| 2.0   | SITE DESCRIPTION .....                                                       | 6  |
| 3.0   | NOISE ASSESSMENT CRITERIA.....                                               | 7  |
| 3.1   | National Planning Policy Framework .....                                     | 7  |
| 3.2   | Planning Practice Guidance – Noise .....                                     | 8  |
| 3.3   | Manchester City Council – Planning and Noise – Technical Guidance 2022 ..... | 9  |
| 3.3.1 | Entertainment Venues .....                                                   | 9  |
| 3.3.2 | Noise and Vibration from fixed plant/ equipment.....                         | 9  |
| 4.0   | SURVEY DETAILS AND RESULTS .....                                             | 10 |
| 4.1   | Environmental Noise Survey .....                                             | 10 |
| 4.2   | Noise Sources .....                                                          | 11 |
| 4.3   | Measurement Results.....                                                     | 11 |
| 4.3.1 | Environmental Noise.....                                                     | 11 |
| 5.0   | NOISE SOURCES – COMMERCIAL UNITS .....                                       | 12 |
| 6.0   | NOISE PROPAGTION AND IMPACT ASSESSMENT .....                                 | 16 |
| 6.1   | Commercial Noise – Façade Break-Out.....                                     | 16 |
| 6.1.1 | L <sub>90</sub> Assessment.....                                              | 16 |
| 6.2   | Mechanical Services – Plant Deck .....                                       | 17 |
| 7.0   | CONCLUSIONS.....                                                             | 20 |

## APPENDIX A – SURVEY DATA CHARTS AND RAW DATA

## APPENDIX B – NOTES FOR QUALITY CONTROL

## APPENDIX C - DEFINITION OF ACOUSTIC TERMS



## 1.0 SUMMARY

PDA Ltd was commissioned by Biz Assets Ltd to carry out a noise impact assessment on the proposed development at 77 – 79 Mosley Street, Manchester. The assessment has covered noise break-out from the facades of the proposed commercial units to the basement and ground floors of the development to the nearest noise sensitive receiver.

It is understood that the refurbishment will incorporate Class E uses to the ground floor and basement areas. For the purposes of this report we have assumed the actual ground floor and basement uses to be any of those falling within Class E which includes, but is not limited to, the uses which we understand to be the most likely of restaurants, cafes, retail. We have also been asked to included assessment for typical public house / bar noise (Sui Generis) within our calculations for the ground floor and basement areas. We have assumed the 1st, 2nd and 3rd floor to be used as office space.

The predicted noise levels at the nearest noise sensitive receiver suggest that the criteria set out by Manchester City Council can be achieved where noise levels are expected to be  $\geq 5$  dB below the typical background sound level across each octave band. In addition, the noise emissions from the proposed plant deck units have been calculated to be more than 5 dB below the typical background sound level at the nearest noise sensitive receiver, therefore satisfying the criteria of Manchester City Council.

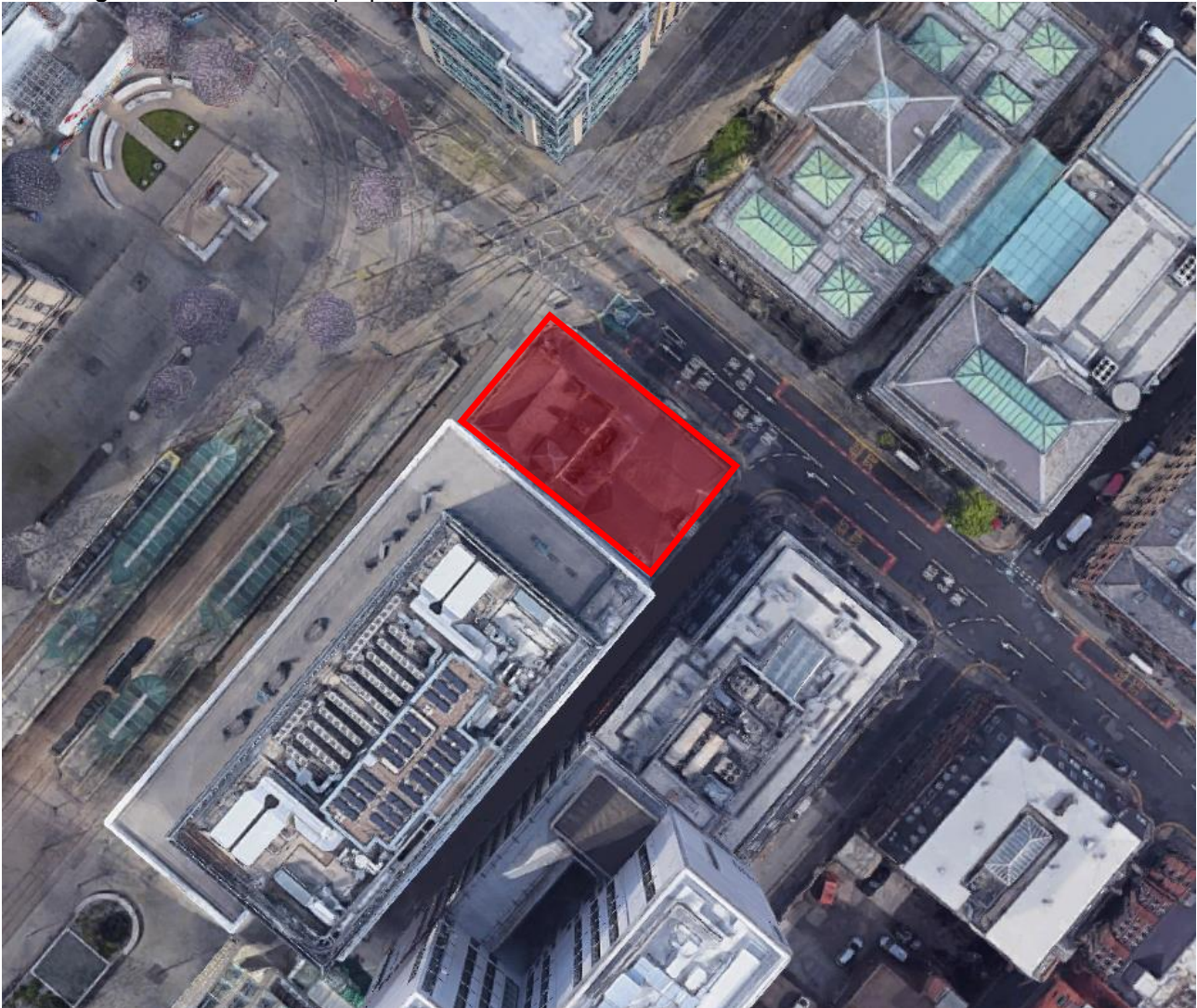
## 2.0 SITE DESCRIPTION

The proposed development consists of the refurbishment of a four storey building located at 77-79 Mosley Street, Manchester comprising of existing commercial use to the basement and ground floor with office space to the first, second and third floors.

The development site is immediately bordered by Mosley Street to the west which opens out into St Peter's Square with the tram line running parallel. To the north of site is Princess Street and to the East is Back George Street. The site is located in a densely developed area neighboured by commercial premises and The Alan Manchester Hotel to the east.

An aerial photo of the location of the site (outlined in red) and surrounding local area is shown in Figure 1 below.

**Figure 1.** Location with proposed site outlined



### 3.0 NOISE ASSESSMENT CRITERIA

#### 3.1 National Planning Policy Framework

National Planning Policy is guided by the National Planning Policy Framework (NPPF) updated in December 2023. With regard to Noise the Framework states the following;

*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.*

*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:*

- *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.*

The terms 'significant adverse impact' and 'adverse impact' are defined in the explanatory notes of the 'Noise Policy Statement for England (NPSE)' which states;

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

*NOEL – No Observed Effect Level*

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

*LOAEL – Lowest Observed Adverse Effect Level*

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

*Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.*

*SOAEL – Significant Observed Adverse Effect Level*

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

The notes also offer an explanation of the term 'adverse impacts' as follows;

*... refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development (paragraph 1.8). This does not mean that such adverse effects cannot occur.*

Although no specific noise limits for LOAEL and SOAEL have been defined, in 2014 the UK Government published a planning practice guidance document for noise which indicates where these limits fall with relation to the perception of noise. A summary is reproduced in Section 3.2 below, and the full document

is published at <https://www.gov.uk/guidance/noise--2>. It is considered that guidance from other acoustic standards may be employed to determine suitable levels within the overall principal of the National Planning Policy Framework.

The National Planning Policy Framework also states:

*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.*

*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.*

### 3.2 Planning Practice Guidance – Noise

In March 2014 (updated July 2019) the UK Government published further guidance on the assessment of noise for planning purposes in the form of the on-line publication, Planning Practice Guidance on noise (<http://www.gov.uk/guidance/noise--2>). This document offers further guidance on the typical levels which constitute the NOEL, LOAEL and SOAEL. The relevant section is reproduced in the table below;

**Table 1. Planning Practice noise level guidance**

| Perception                                | Examples of Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                  | Increasing Effect Level    | Action                           |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------|
| No Observed Effect Level                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                            |                                  |
| <b>Not present</b>                        | No Effect                                                                                                                                                                                                                                                                                                                                                                                                                                             | No Observed Effect         | No specific measures required    |
| No Observed Adverse Effect Level          |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                            |                                  |
| <b>Present and not intrusive</b>          | Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.                                                                                                                                                                                                                | No Observed Adverse Effect | No specific measures required    |
| Lowest Observed Adverse Effect Level      |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                            |                                  |
| <b>Present and intrusive</b>              | Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life. | Observed Adverse Effect    | Mitigate and reduce to a minimum |
| Significant Observed Adverse Effect Level |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                            |                                  |

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                     |         |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|---------|
| <b>Present and disruptive</b>      | The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area. | Significant Observed Adverse Effect | Avoid   |
| <b>Present and very disruptive</b> | Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory                                                                                                                                                                                        | Unacceptable Adverse Effect         | Prevent |

It is notable from the above planning guidance that development should not normally be permitted above Significant Observed Adverse Effect Levels, and should aim to minimise other Adverse Effect Levels (below SOAEL but above LOAEL). However, it is clear that noise is permitted to approach and/or exceed the Lowest Observed Adverse Effect Level, providing that noise is mitigated and reduced to a minimum.

### 3.3 Manchester City Council – Planning and Noise – Technical Guidance 2022

In June 2022, Manchester City Council (MCC) published an updated guidance document '*Planning & Noise – Technical Guidance*' in order to provide help and advice in relation to noise in a planning context to encourage good acoustic design. The documentation outlines what is expected in relation to current practice and policy with the ambition that new developments achieve the highest possible standards without compromising the health and well being of people that live and work within the City of Manchester.

#### 3.3.1 Entertainment Venues

'Entertainment Venues' are not strictly defined within the technical guidance, however it is inferred that venues including for the playing of recorded music should be considered as an Entertainment Venue.

The guidance states that where a new entertainment venue is structurally detached from other building uses, it should be demonstrated that music noise from the proposal will not be 'audible' in nearby residential properties, assuming that the residential properties in question have their windows open. The criteria is explained as such:

*'Entertainment noise ( $L_{Aeq,5min}$ ) should be controlled to 5 dB below the typical background noise level ( $L_{A90}$ ) in each octave band at the nearest noise sensitive location.'*

#### 3.3.2 Noise and Vibration from fixed plant/ equipment

The technical guidance provided by the MCC also provides guidance on the installation of fixed plant/ equipment in regards to design which demonstrates that the resultant noise level at a noise sensitive receiver should be negligible and not give rise to complaints. The guidance discusses the following criteria which aims to achieve this:

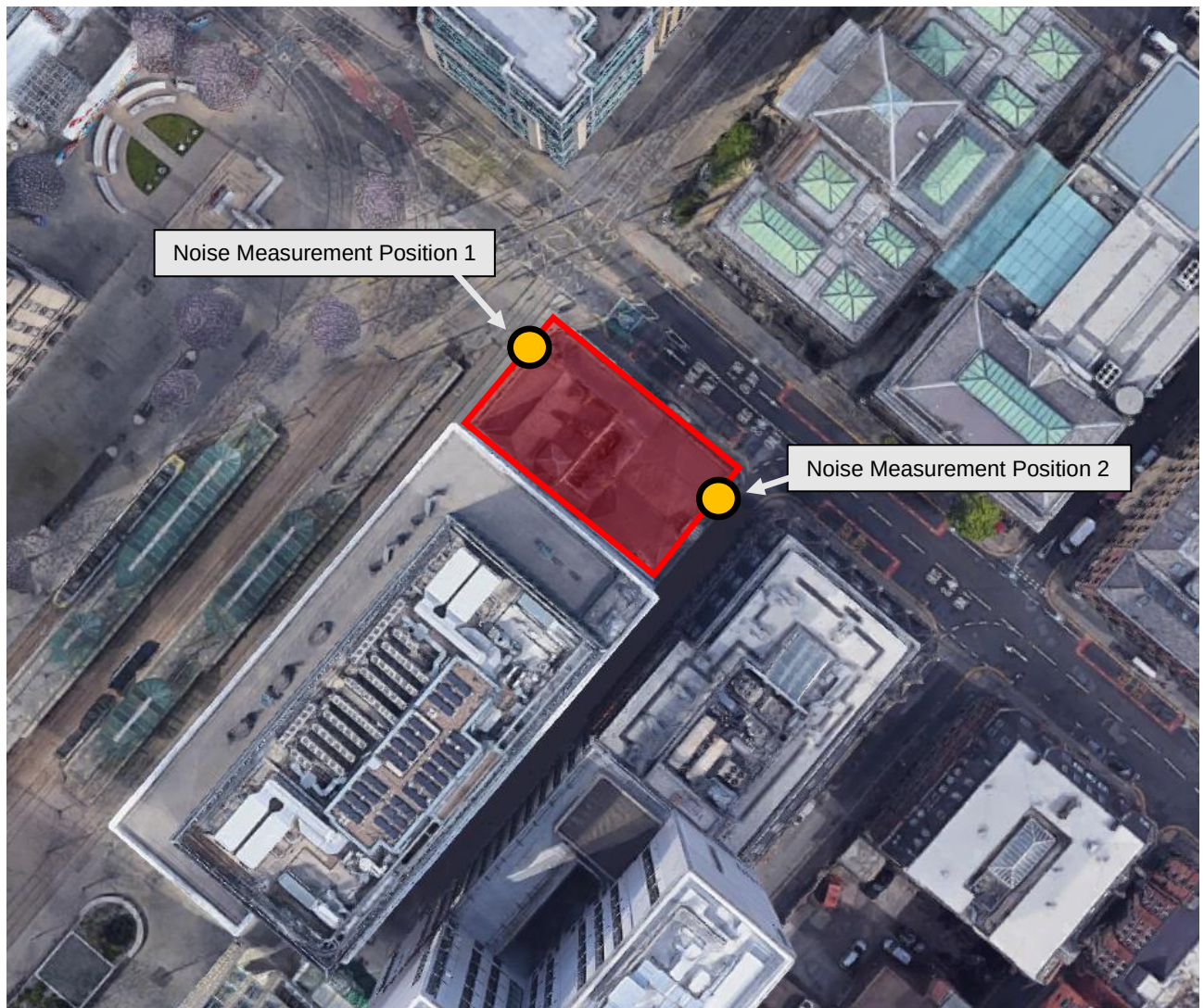
*'Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB ( $L_{Aeq}$ ) below the typical background ( $L_{A90}$ ) level at the nearest noise sensitive location'.*

## 4.0 SURVEY DETAILS AND RESULTS

### 4.1 Environmental Noise Survey

An ambient noise survey was carried out at site in a location which was deemed to be representative of the noise climate for the closest residential receivers and the noise incident on the existing building. The locations of which can be seen in Figure 2 below.

**Figure 2. Noise Surveys Monitoring Positions**



The noise level survey was undertaken at the site from 10:46 hours Monday 6<sup>th</sup> February to 12:50 hours Tuesday 7<sup>th</sup> February 2023. The periods measured were deemed to be representative of day and night-time hours. Long-term measurements were taken at two positions across the existing site, as shown in the figure above. Measurements were made and partially attended by David Hible and Joseph Meadows of PDA Ltd. Measurements were of continuous 5 minute samples. The noise survey was conducted using 2 no. NTi XL2 sound level meter for which calibration certificates are held.

The NTi XL2s have a Class 1 frequency response as per BS EN 61672-1:2003. For all surveys the sound level meters were field calibrated both before and after the measurement period, during which

time no significant deviation from the calibrated level was observed. The sound level meter was fitted with a microphone windshield at all times.

The microphone of the sound level meters was mounted on a pole 1m out of the existing first and second floor windows and at least 3m from surrounding structures and can be assumed to be a free field measurement. All measurements were undertaken with a fast time-weighting and broadband statistics were measured throughout. In addition, octave band frequency spectra and audio were recorded.

#### Weather

Weather conditions varied throughout the survey however typical conditions were as followed:

Temperature- 0-9°C  
Wind - 1-2m/s, (Northernly)  
Rain - No precipitation

## 4.2 Noise Sources

While attending site the ambient noise climate was noted to be dominated by the tram line to the west of site and by road traffic noise from Princess Street to the north of site. Noise from extract and ventilation units was present through the day and night-time periods on Back George Street to the east of site.

## 4.3 Measurement Results

### 4.3.1 Environmental Noise

Full measurement charts and raw survey data are provided in Appendix A of this report. A summary of the results is given below:

**Table 2. Summary of environmental noise measurements – Measurement Position 1**

| Position | Time Period (hh:mm)                                        | Duration (hh:mm) | L <sub>Aeq,T</sub> (dB) | Typical Background Sound Level L <sub>A90</sub> (dB) <sup>1</sup> |
|----------|------------------------------------------------------------|------------------|-------------------------|-------------------------------------------------------------------|
| 1        | Day<br>6/02/2023 10:46 – 23:00<br>07/02/2023 07:00 – 12:45 | 17:59            | 68                      | 58                                                                |
|          | Night<br>6-7/02/2023 23:00 – 07:00                         | 08:00            | 64                      | 46                                                                |

**Table 3. Summary of environmental noise measurements – Measurement Position 2**

| Position | Time Period (hh:mm)                                        | Duration (hh:mm) | L <sub>Aeq,T</sub> (dB) | Typical Background Sound Level L <sub>A90</sub> (dB) <sup>1</sup> |
|----------|------------------------------------------------------------|------------------|-------------------------|-------------------------------------------------------------------|
| 1        | Day<br>6/02/2023 11:07 – 23:00<br>07/02/2023 07:00 – 12:50 | 17:43            | 63                      | 55                                                                |
|          | Night<br>6-7/02/2023 23:00 – 07:00                         | 08:00            | 59                      | 50                                                                |

**Notes:**

- 1 Typical background sound level has been derived by taking the modal value.

## 5.0 NOISE SOURCES – COMMERCIAL UNITS

It is understood that the refurbishment will incorporate Class E uses to the ground floor and basement areas. For the purposes of this report we have assumed the actual ground floor and basement uses to be any of those falling within Class E which includes, but is not limited to, the uses which we understand to be the most likely of restaurants, cafes, retail. We have also been asked to included assessment for typical public house / bar noise (Sui Generis) within our calculations for the ground floor and basement areas. We have assumed the 1st, 2nd and 3rd floor to be used as office space.

A layout of the basement and ground floor areas are shown in the Figures below which are taken from Atelier AB Urban Architects drawing ref: '1995 E(100) Basement Plan Preliminary[2][1]' and '1995-P(110)-A-Ground Floor Plan Preliminary'. The areas of proposed use are indicated within the figures:

**Figure 3. Basement layout**

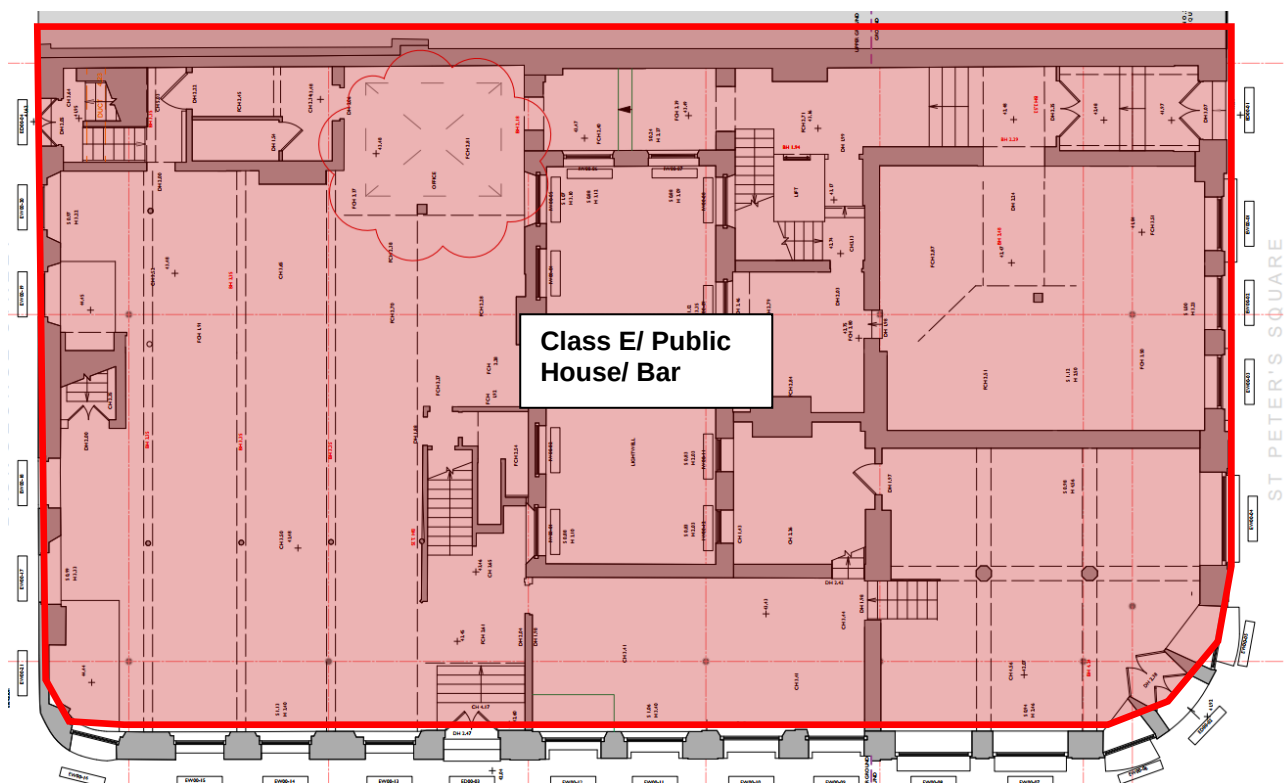
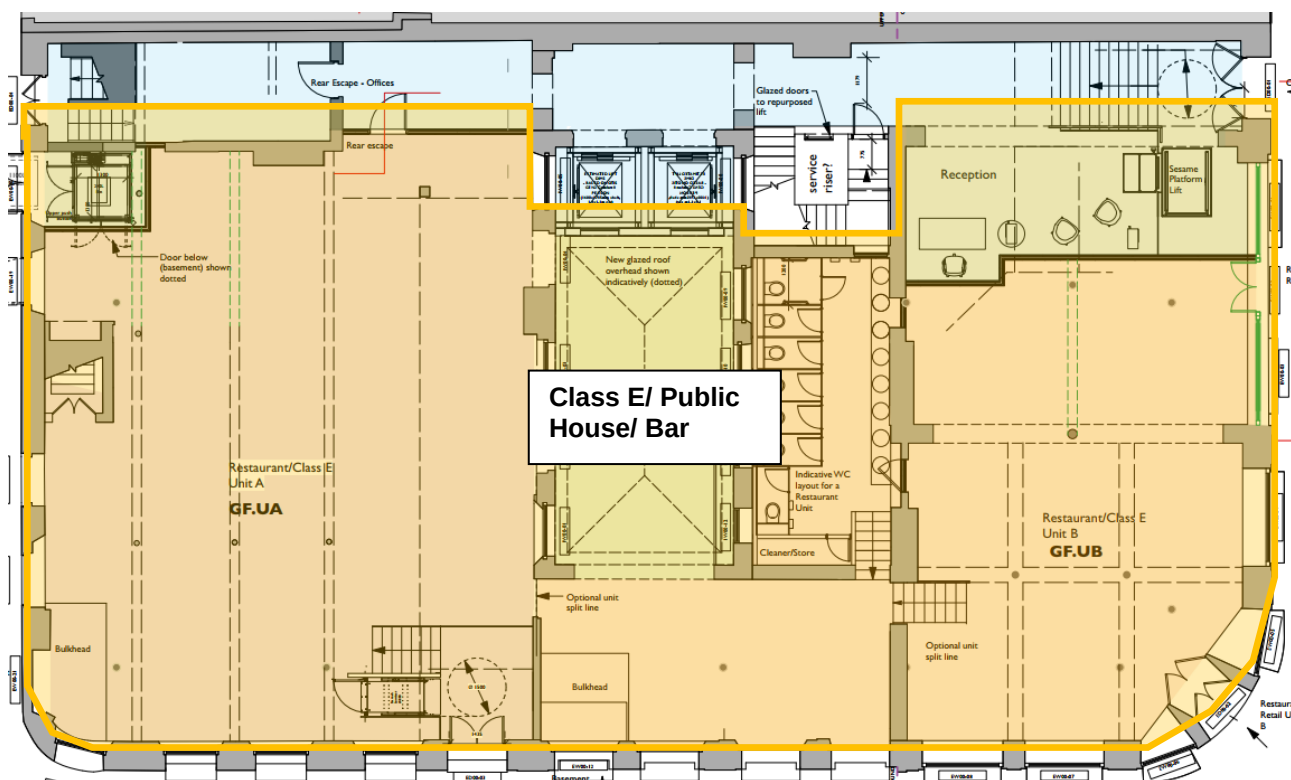


**Figure 4. Ground Floor Layout**



We have been informed that the glazing units are to be reinstated to the single glazed sash windows. We have assumed the single glazing to be of 4mm thickness where the expected sound reduction performance of which is shown in Table 4 below.

We would suggest that in the higher noise generation areas, such as public houses and bars proposed to the basement level, that a secondary glazing unit is installed in order to adequately control the noise break-out. We would recommend a build up of 4mm glazing/ 150mm air gap cavity/ 6mm glazing. The expected sound reduction performance of this particular build up is given in Table 4 below.

**Table 4. Sound Reduction Performance of Glazing (minimum)**

|                                               | Sound Reduction Index dB,<br>Octave Band Centre Frequency Hz |     |     |     |    |    |    |    | R <sub>w</sub><br>dB(A) |
|-----------------------------------------------|--------------------------------------------------------------|-----|-----|-----|----|----|----|----|-------------------------|
|                                               | 63                                                           | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                         |
| Single Glazing – 4mm                          | 15                                                           | 17  | 21  | 26  | 30 | 33 | 30 | 30 | 26                      |
| Secondary Glazing –<br>(4mm/150mm cavity/6mm) | 23                                                           | 29  | 35  | 45  | 56 | 52 | 50 | 50 | 44                      |

We would consider noise generation from office use to be fairly low and noise break-out to be negligible compared to the proposed uses on basement and ground level, thus we have not included this within the assessment. In order to assess the noise break out of Sui Generis and Class E uses we have used noise levels from PDA's database measured within similar premises and are deemed representative of the intended use. The assumed noise levels are shown in the tables below along with the calculation for noise break-out of each façade area.

**Table 5. Proposed Sui Generis Commercial Use – Sound Insulation Performance of Area Source  
– Basement East Façade (facing Back George Street)**

| Cladding Element                                                                | Proportion of Area m <sup>2</sup> | Sound Reduction Index<br>Octave Band Centre Frequencies (Hz)<br>dB |     |     |     |    |    |    |    |                                    |
|---------------------------------------------------------------------------------|-----------------------------------|--------------------------------------------------------------------|-----|-----|-----|----|----|----|----|------------------------------------|
|                                                                                 |                                   | 63                                                                 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                                    |
| Solid Brick Wall*                                                               | 20                                | 41                                                                 | 44  | 41  | 44  | 52 | 60 | 65 | 65 |                                    |
| Secondary Glazing (4/150/6)                                                     | 5                                 | 23                                                                 | 29  | 35  | 45  | 56 | 52 | 50 | 50 |                                    |
|                                                                                 |                                   |                                                                    |     |     |     |    |    |    |    | <b>A-Weighted Sound Level (dB)</b> |
| Internal Noise Level (Busy City Centre Bar)                                     |                                   | 95                                                                 | 95  | 86  | 85  | 86 | 83 | 79 | 75 | <b>90</b>                          |
| Composite SRI                                                                   |                                   | 30                                                                 | 35  | 39  | 44  | 53 | 57 | 56 | 56 | -                                  |
| Direct to Free Field Correction                                                 |                                   | -6                                                                 | -6  | -6  | -6  | -6 | -6 | -6 | -6 | -                                  |
| Brick/Glazing Area Correction                                                   |                                   | 14                                                                 | 14  | 14  | 14  | 14 | 14 | 14 | 14 | -                                  |
| Resultant A-weighted Radiating Area Source (L <sub>w</sub> per m <sup>2</sup> ) |                                   | 33                                                                 | 37  | 32  | 32  | 27 | 21 | 18 | 14 | <b>41</b>                          |

\*Within our calculations it has been assumed that the existing exterior masonry wall is of solid brick construction of at least 215mm depth.

**Table 6. Proposed Sui Generis Commercial Use – Sound Insulation Performance of Area Source  
– Basement North Façade (facing Princess Street)**

| Cladding Element                                                                | Proportion of Area m <sup>2</sup> | Sound Reduction Index<br>Octave Band Centre Frequencies (Hz)<br>dB |     |     |     |    |    |    |    |                                    |
|---------------------------------------------------------------------------------|-----------------------------------|--------------------------------------------------------------------|-----|-----|-----|----|----|----|----|------------------------------------|
|                                                                                 |                                   | 63                                                                 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                                    |
| Solid Brick Wall*                                                               | 25                                | 41                                                                 | 44  | 41  | 44  | 52 | 60 | 65 | 65 |                                    |
| Secondary Glazing (4/150/6)                                                     | 11                                | 23                                                                 | 29  | 35  | 45  | 56 | 52 | 50 | 50 |                                    |
|                                                                                 |                                   |                                                                    |     |     |     |    |    |    |    | <b>A-Weighted Sound Level (dB)</b> |
| Internal Noise Level (Busy City Centre Bar)                                     |                                   | 95                                                                 | 95  | 86  | 85  | 86 | 83 | 79 | 75 | <b>90</b>                          |
| Composite SRI                                                                   |                                   | 28                                                                 | 34  | 38  | 44  | 53 | 56 | 55 | 55 | -                                  |
| Direct to Free Field Correction                                                 |                                   | -6                                                                 | -6  | -6  | -6  | -6 | -6 | -6 | -6 | -                                  |
| Brick/Glazing Area Correction                                                   |                                   | 16                                                                 | 16  | 16  | 16  | 16 | 16 | 16 | 16 | -                                  |
| Resultant A-weighted Radiating Area Source (L <sub>w</sub> per m <sup>2</sup> ) |                                   | 35                                                                 | 39  | 33  | 32  | 27 | 22 | 19 | 15 | <b>42</b>                          |

**Table 7. Proposed Class E Commercial Use – Sound Insulation Performance of Area Source – Ground Floor East Facade (facing Back George Street)**

| Cladding Element                                                                | Proportion of Area m <sup>2</sup> | Sound Reduction Index<br>Octave Band Centre Frequencies (Hz)<br>dB |     |     |     |    |    |    |    |                                    |
|---------------------------------------------------------------------------------|-----------------------------------|--------------------------------------------------------------------|-----|-----|-----|----|----|----|----|------------------------------------|
|                                                                                 |                                   | 63                                                                 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                                    |
| Solid Brick Wall*                                                               | 34                                | 41                                                                 | 44  | 41  | 44  | 52 | 60 | 65 | 65 |                                    |
| Single Glazing – 4mm                                                            | 10                                | 15                                                                 | 17  | 21  | 26  | 30 | 33 | 30 | 30 |                                    |
|                                                                                 |                                   |                                                                    |     |     |     |    |    |    |    | <b>A-Weighted Sound Level (dB)</b> |
| Restaurant (Busy Weekend Night)                                                 |                                   | 75                                                                 | 74  | 73  | 71  | 69 | 68 | 58 | 58 | <b>74</b>                          |
| Composite SRI                                                                   |                                   | 21                                                                 | 23  | 27  | 32  | 36 | 39 | 36 | 36 | -                                  |
| Direct to Free Field Correction                                                 |                                   | -6                                                                 | -6  | -6  | -6  | -6 | -6 | -6 | -6 | -                                  |
| Brick/Glazing Area Correction                                                   |                                   | 16                                                                 | 16  | 16  | 16  | 16 | 16 | 16 | 16 | -                                  |
| Resultant A-weighted Radiating Area Source (L <sub>w</sub> per m <sup>2</sup> ) |                                   | 21                                                                 | 29  | 31  | 30  | 27 | 24 | 17 | 17 | <b>36</b>                          |

**Table 8. Proposed Class E Commercial Use – Sound Insulation Performance of Area Source – Ground Floor North Facade (facing Princess Street)**

| Cladding Element                                                                | Proportion of Area m <sup>2</sup> | Sound Reduction Index<br>Octave Band Centre Frequencies (Hz)<br>dB |     |     |     |    |    |    |    |                                    |
|---------------------------------------------------------------------------------|-----------------------------------|--------------------------------------------------------------------|-----|-----|-----|----|----|----|----|------------------------------------|
|                                                                                 |                                   | 63                                                                 | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                                    |
| Solid Brick Wall*                                                               | 41                                | 41                                                                 | 44  | 41  | 44  | 52 | 60 | 65 | 65 |                                    |
| Single Glazing – 4mm                                                            | 22                                | 15                                                                 | 17  | 21  | 26  | 30 | 33 | 30 | 30 |                                    |
|                                                                                 |                                   |                                                                    |     |     |     |    |    |    |    | <b>A-Weighted Sound Level (dB)</b> |
| Restaurant (Busy Weekend Night)                                                 |                                   | 75                                                                 | 74  | 73  | 71  | 69 | 68 | 58 | 58 | <b>74</b>                          |
| Composite SRI                                                                   |                                   | 20                                                                 | 22  | 26  | 31  | 35 | 38 | 35 | 35 | -                                  |
| Direct to Free Field Correction                                                 |                                   | -6                                                                 | -6  | -6  | -6  | -6 | -6 | -6 | -6 | -                                  |
| Brick/Glazing Area Correction                                                   |                                   | 18                                                                 | 18  | 18  | 18  | 18 | 18 | 18 | 18 | -                                  |
| Resultant A-weighted Radiating Area Source (L <sub>w</sub> per m <sup>2</sup> ) |                                   | 23                                                                 | 30  | 33  | 31  | 28 | 26 | 18 | 18 | <b>38</b>                          |

## 6.0 NOISE PROPAGTION AND IMPACT ASSESSMENT

### 6.1 Commercial Noise – Façade Break-Out

Using the predicted break-out noise level data above, a 3-dimensional computer noise model has been constructed using SoundPLAN noise modelling software to determine the noise level impact upon the closest noise sensitive receiver which is understood to be The Alan Manchester Hotel located on the opposite side of Back George Street. All calculations have followed the methodology contained within ISO 9613-2:1996 *Attenuation of sound during propagation outdoors - Part 2: General method of calculation*. The topographical data for the site and surrounding area is taken from Google Maps Terrain height data.

The model has been calibrated to the calculated area sources associated with the basement and ground floor commercial units. A ground absorption coefficient of 0 has been used to take into account the predominantly hard surfaces of roads, hard standing, etc. Noise level incident upon The Alan Manchester Hotel has been calculated at 2.4m above ground level and 2.8m for each additional floor for the 5 storey premises. The receiver locations have been calculated at the Princess Street façade (1) and the Back George Street façade (2). The calculated noise levels at each receiver are shown in the SoundPLAN model below.

**Figure 5. SoundPLAN noise model showing area source and receiver locations**



#### 6.1.1 L<sub>90</sub> Assessment

As discussed within Section 3.3, part of the planning guidance provided by Manchester City Council states that any associated entertainment noise should comply with the limits of being controlled to 5 dB

below the  $L_{A90}$  (without entertainment noise) in each octave band at the façade of the nearest noise sensitive location where structurally detached. The predicted levels due to entertainment noise break-out have been compared with the derived  $L_{A90}$  octave spectrum, as given in Table 3 of Section 4.3.1, are displayed in the table below. The typical background sound level is taken from the night-time period of measurement Position 2.

**Table 9. Assessment against  $L_{A90}$  – Nearest Existing Residencies**

| Assessment Location |                                        | Octave Band Noise Level Data (dB[A]) |     |     |     |     |     |     |     | Noise Level (dB[A]) |
|---------------------|----------------------------------------|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|---------------------|
|                     |                                        | 63                                   | 125 | 250 | 500 | 1k  | 2k  | 4k  | 8k  |                     |
| Existing Receiver 1 | Measured $L_{A90}$                     | 31                                   | 36  | 41  | 45  | 46  | 43  | 35  | 23  | 50                  |
|                     | Predicted Level of Entertainment Noise | 15                                   | 19  | 14  | 14  | 9   | 3   | 0   | 0   | 23                  |
|                     | Level Difference to Background         | -16                                  | -17 | -27 | -31 | -37 | -40 | -35 | -23 | -                   |
| Existing Receiver 2 | Measured $L_{A90}$                     | 31                                   | 36  | 41  | 45  | 46  | 43  | 35  | 23  | 50                  |
|                     | Predicted Level of Entertainment Noise | 26                                   | 31  | 26  | 25  | 21  | 15  | 11  | 7   | 35                  |
|                     | Level Difference to Background         | -5                                   | -5  | -15 | -20 | -25 | -28 | -24 | -16 | -                   |

NOTE: Measured  $L_{A90}$  in octave bands is based upon the average for each period and normalised to the modal  $L_{A90}$ .

As can be seen from the Table above, the predicted entertainment noise level due to noise break out from the façades of the proposed commercial units are  $\geq 5$  dB below the existing  $L_{A90}$  in each octave band. This is therefore likely to comply with the planning guidance as set out by Manchester City Council.

It is important to note that the internal noise levels stated in Tables 5 to 8 should not be exceeded and it is recommended to use a limiter on any PA systems that may be installed in order to ensure that the existing typical background sound levels at the receivers are not exceeded above the criteria.

## 6.2 Mechanical Services – Plant Deck

As discussed within Section 3.3.2, the technical guidance document supplied by Manchester City Council specifies that noise from any externally mounted plant, equipment and servicing should achieve a rating level of 5 dB below the typical background. Therefore, we would propose the following limits:

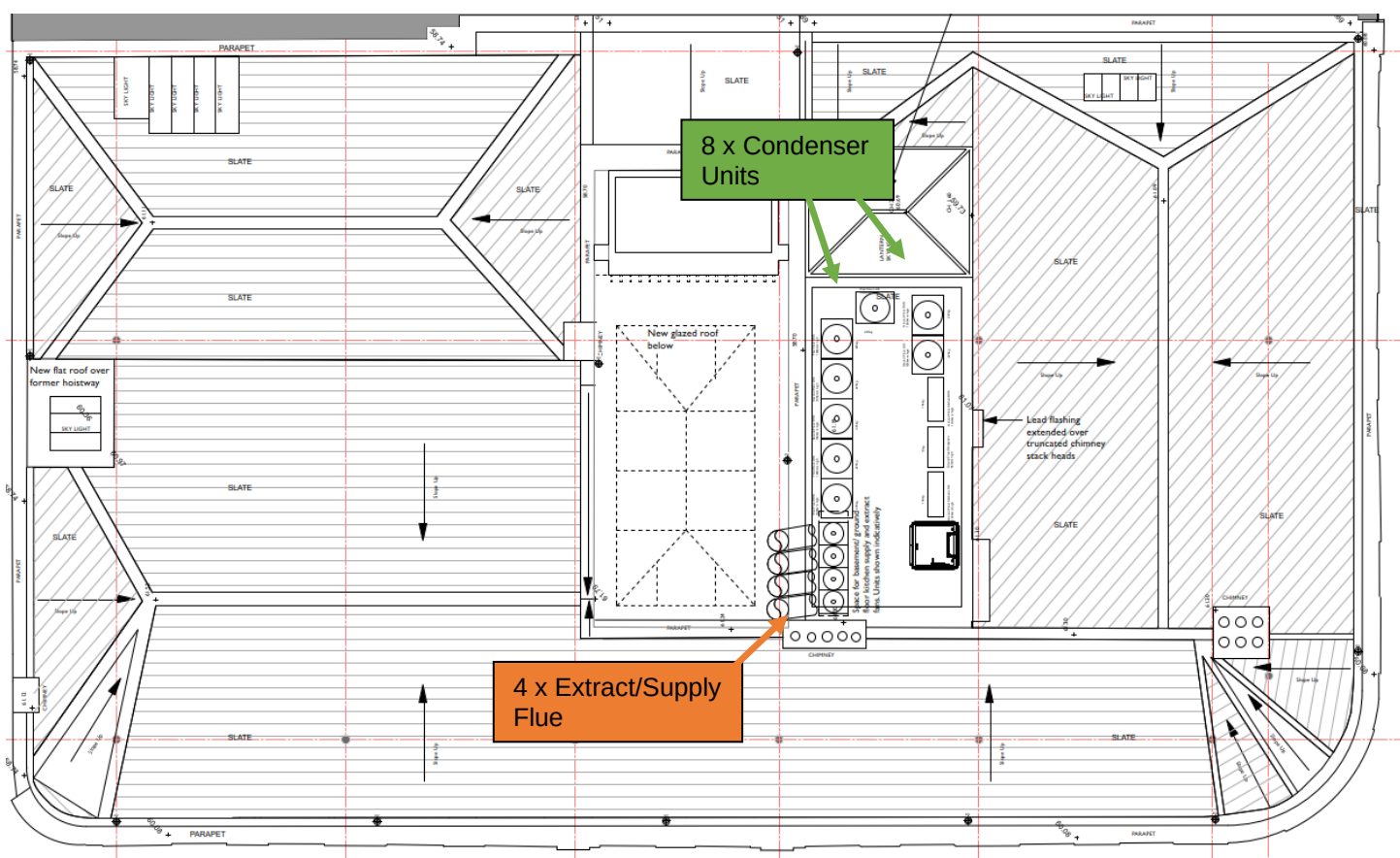
**Table 10. Noise limit for all external mechanical services at nearest noise sensitive receiver**

| Typical Background Sound Level $L_{A90}$ (dB) | Cumulative noise limit for all proposed external mechanical services $L_{Aeq}$ (dB) at the nearest noise sensitive location |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| 50                                            | 45                                                                                                                          |

NOTE: It has been assumed that the closest noise sensitive receiver to the proposed plant deck location will be The Alan Hotel Manchester, therefore the limit is based off the typical background sound level as measured at Position 2. Where this is not the case a different limit value may be more appropriate.

It is our understanding that a plant deck is proposed to the roof area of the development which will consists of 8 no. condenser units and 4 no. supply/extract flue units ref: '1995 P(150)GRoof Plan Preliminary'. The locations of which are shown in the figure below:

**Figure 6. Plant Deck Location – Rev G**



We have been informed that the selected condenser units have a sound pressure level of 59 dB(A) when measured at 1 meter. As we have not been supplied with octave band data for the specific units we have used previously measured condenser measurements from the PDA database and normalised this against the stated sound pressure level of 59 dB(A). This is summarised in the table below:

**Table 11. Condenser Unit Noise Levels – Sound Pressure Levels**

|                | Octave Band Noise Level Data (dB) |     |     |     |    |    |    |    | Noise Level (dB[A]) |
|----------------|-----------------------------------|-----|-----|-----|----|----|----|----|---------------------|
|                | 63                                | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                     |
| Condenser Unit | 57                                | 62  | 59  | 59  | 54 | 47 | 42 | 36 | <b>59</b>           |

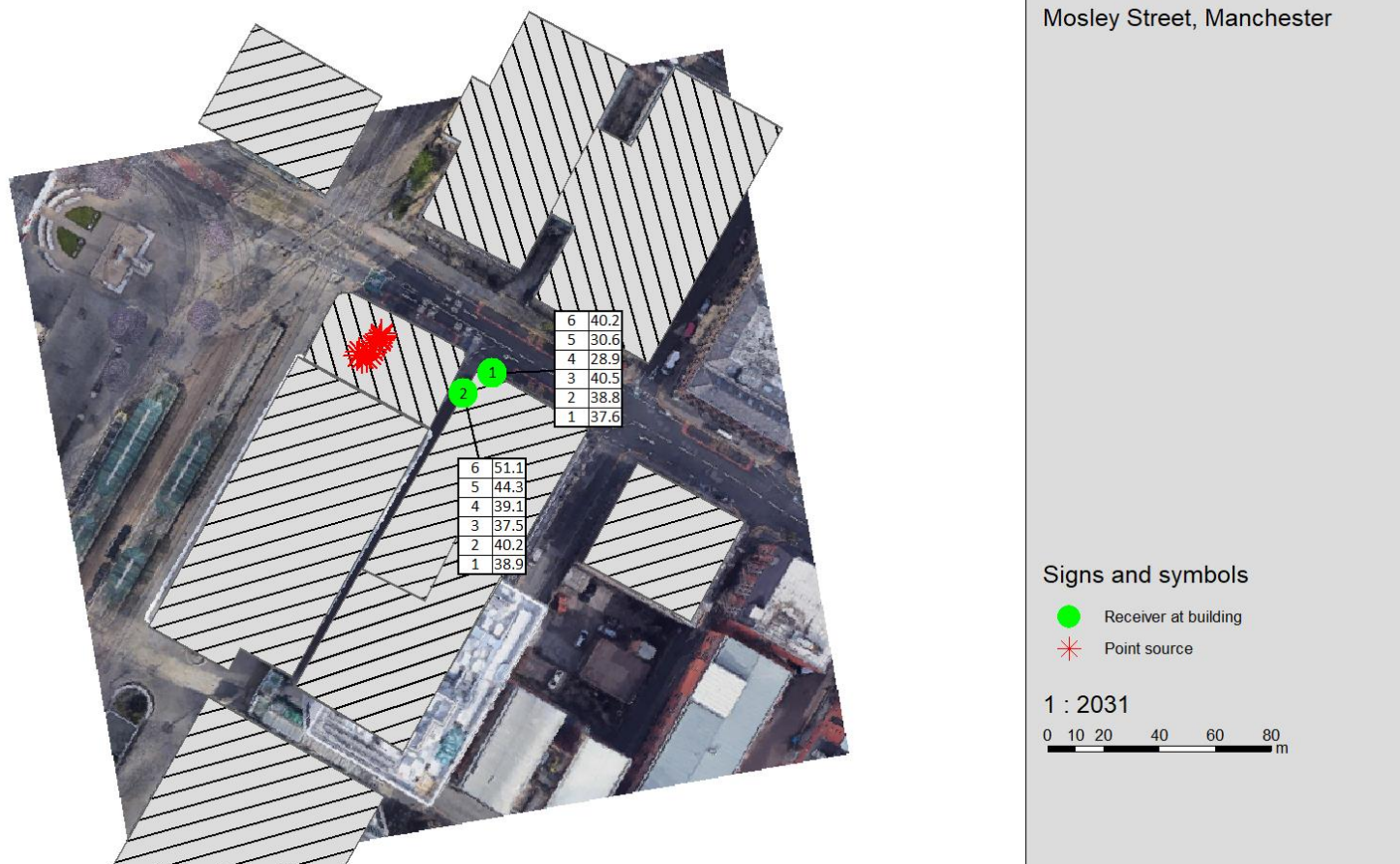
It is understood that the extract and flue have not yet been specified, therefore we have utilised previous measurements from the PDA database to enable the modelling for assessment. The noise levels assumed for each unit are as follows. Please note these are given as sound power levels.

**Table 12. Supply/Extract Flue – Sound Power Levels**

|                     | Octave Band Noise Level Data (dB) |     |     |     |    |    |    |    | Noise Level (dB[A]) |
|---------------------|-----------------------------------|-----|-----|-----|----|----|----|----|---------------------|
|                     | 63                                | 125 | 250 | 500 | 1k | 2k | 4k | 8k |                     |
| Supply/Extract Flue | 78                                | 87  | 83  | 81  | 79 | 75 | 74 | 67 | <b>84</b>           |

This noise data has then been inputted for each plant location into the SoundPLAN model in order to predict the noise level at the closest noise sensitive receiver. The calculated levels are shown in the Figure below. Please note the noise levels presented below are excluding the noise break-out from the proposed uses to the basement and ground floor of the development.

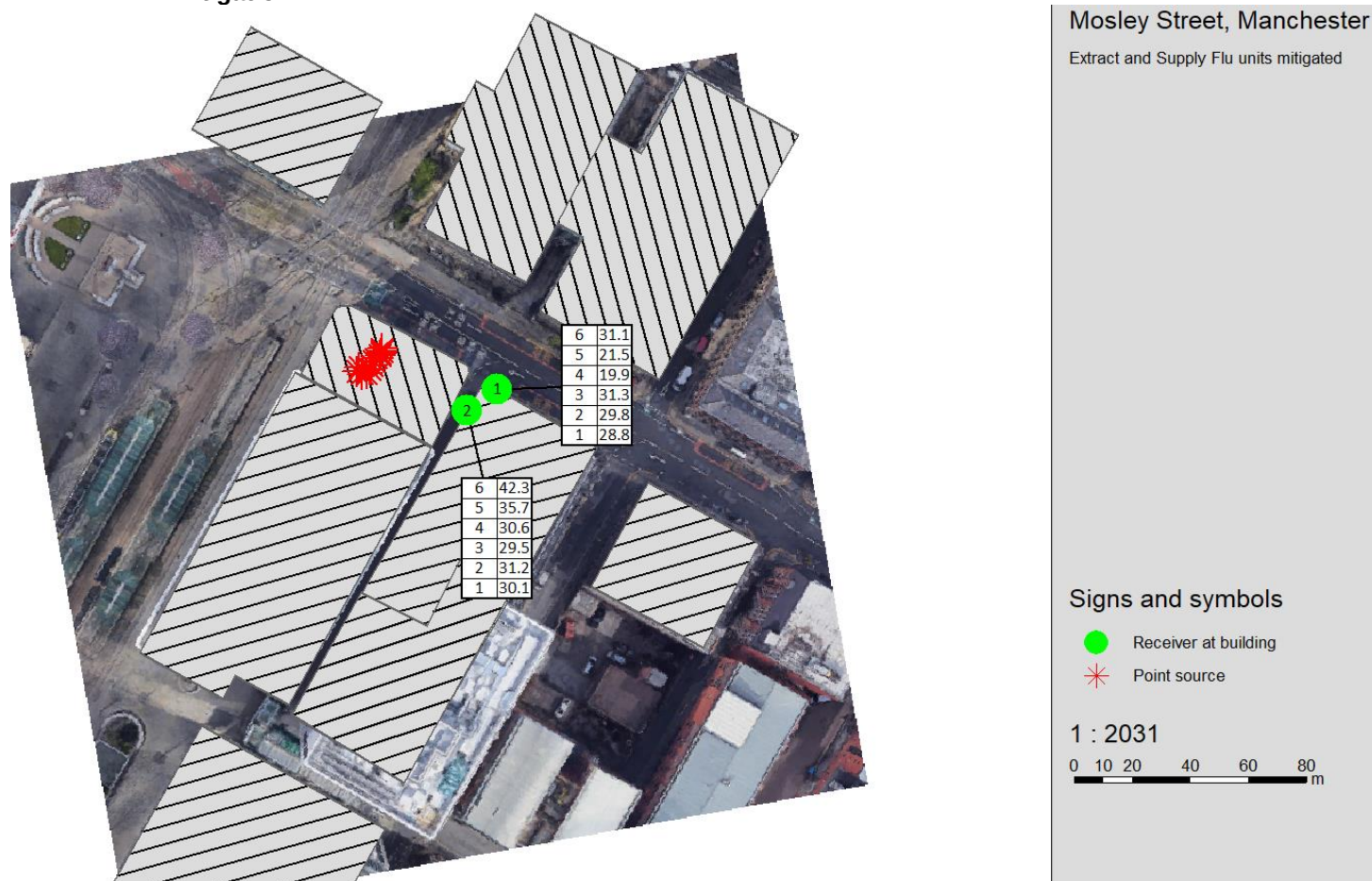
**Figure 7. SoundPLAN noise model condenser noise sources and receiver locations**



The highest calculated noise level can be seen on floor 6 at receiver 2 at 51 dB (A). Therefore, we would note that this exceeds the derived noise limit of 45 dB (A) as given within Table 10. We would therefore suggest that the extract and flue units should be limited to a sound power level of 74 dB(A). This may be in the form of selecting quiet units or applying silencers.

The SoundPLAN model below shows the noise levels at the closest receivers once the extract and flue units have been mitigated:

**Figure 8. SoundPLAN noise model condenser noise sources and receiver locations – post mitigation**



The highest calculated noise level can be seen on floor 6 at receiver 2 at 42 dB (A). We would comment that this falls below the derived noise limit of 45 dB (A) as given within table 10. Therefore, we would suggest that noise emissions as a result of the proposed condenser units would satisfy the criteria set out by Manchester City Council and would be unlikely to require any further mitigation.

Once the specific plant units have been chosen we would recommend that further assessment is carried out to ensure that the noise levels comply with the derived noise limit of 45 dB (A).

## 7.0 CONCLUSIONS

PDA Ltd was commissioned by Biz Assets Ltd to carry out a noise impact assessment on the proposed development at 77 – 79 Mosley Street, Manchester. The assessment has covered noise break-out from the facades of the proposed commercial units to the basement and ground floors of the development to the nearest noise sensitive receiver.

It is understood that the refurbishment will incorporate Class E uses to the ground floor and basement areas. For the purposes of this report we have assumed the actual ground floor and basement uses to be any of those falling within Class E which includes, but is not limited to, the uses which we understand to be the most likely of restaurants, cafes, retail. We have also been asked to included assessment for typical public house / bar noise (Sui Generis) within our calculations for the ground floor and basement areas. We have assumed the 1st, 2nd and 3rd floor to be used as office space.

The predicted noise levels at the nearest noise sensitive receiver suggest that the criteria set out by Manchester City Council can be achieved where noise levels are expected to be  $\geq 5$  dB below the typical



background sound level across each octave band. In addition, the noise emissions from the proposed plant deck units have been calculated to be more than 5 dB below the typical background sound level at the nearest noise sensitive receiver, therefore satisfying the criteria of Manchester City Council.

## APPENDIX A – NOISE SURVEY CHARTS AND RAW DATA

Figure 9. Ambient Noise Level Survey Chart – Position 1

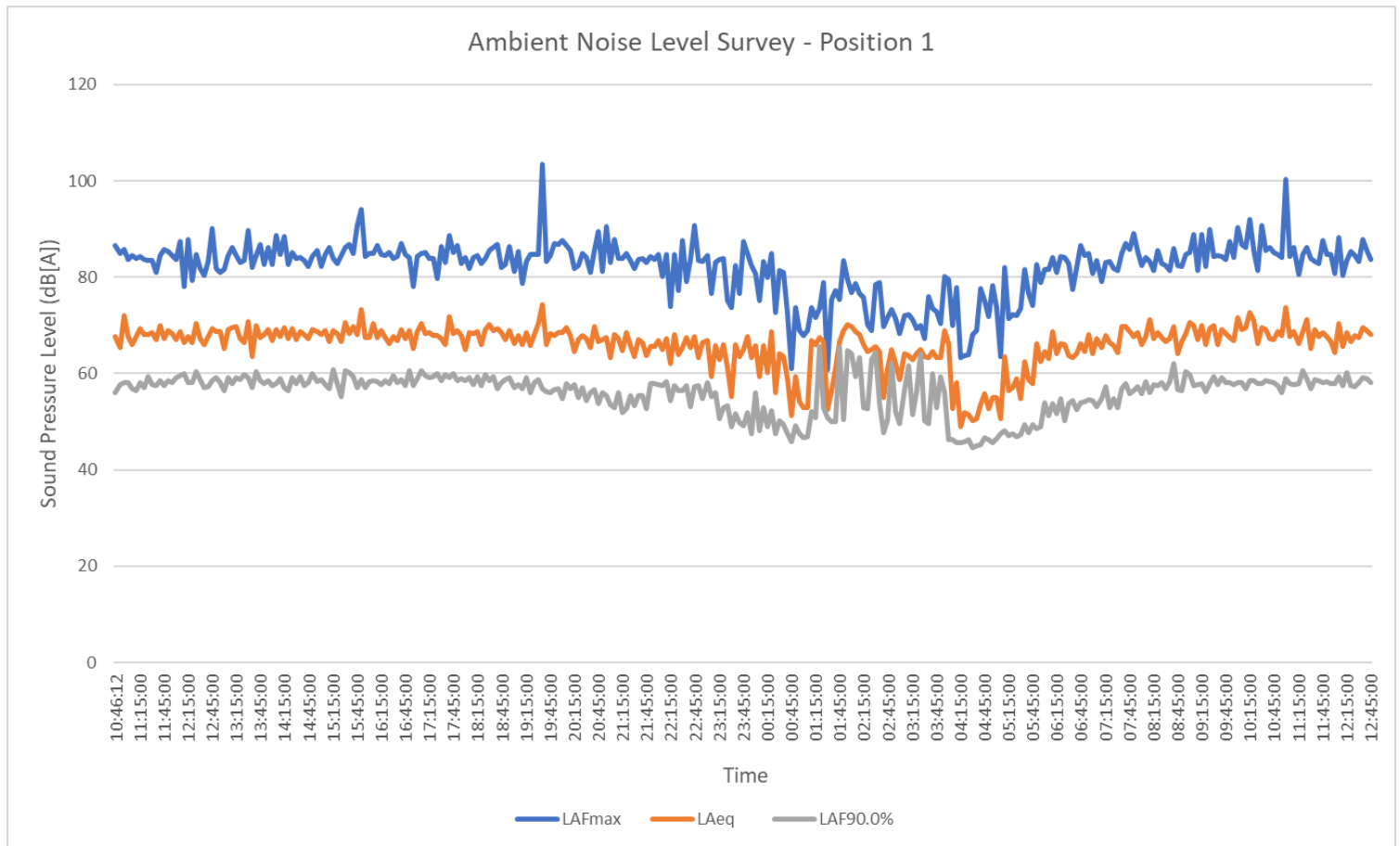


Figure 10. Ambient Noise Level Survey Chart – Position 2

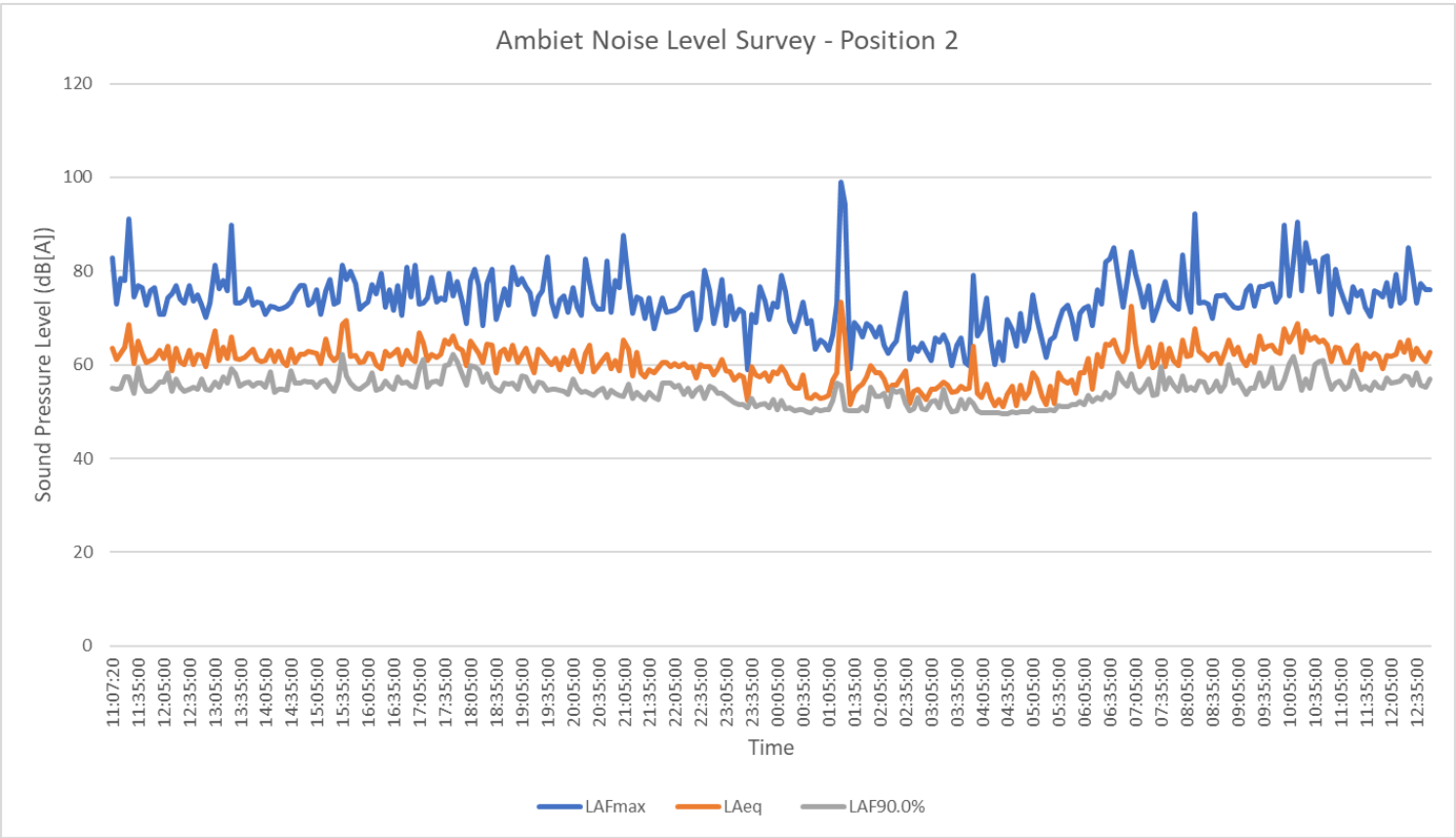


Figure 11. Typical Background Sound Level – Position 1 – Day-time

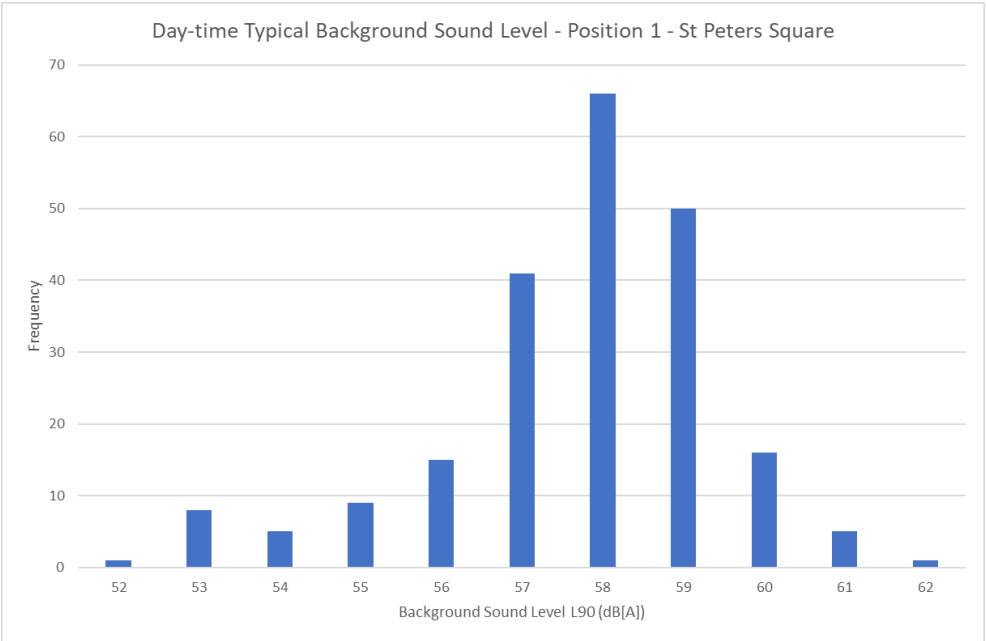


**Figure 12. Typical Background Sound Level – Position 1 – Night-time**

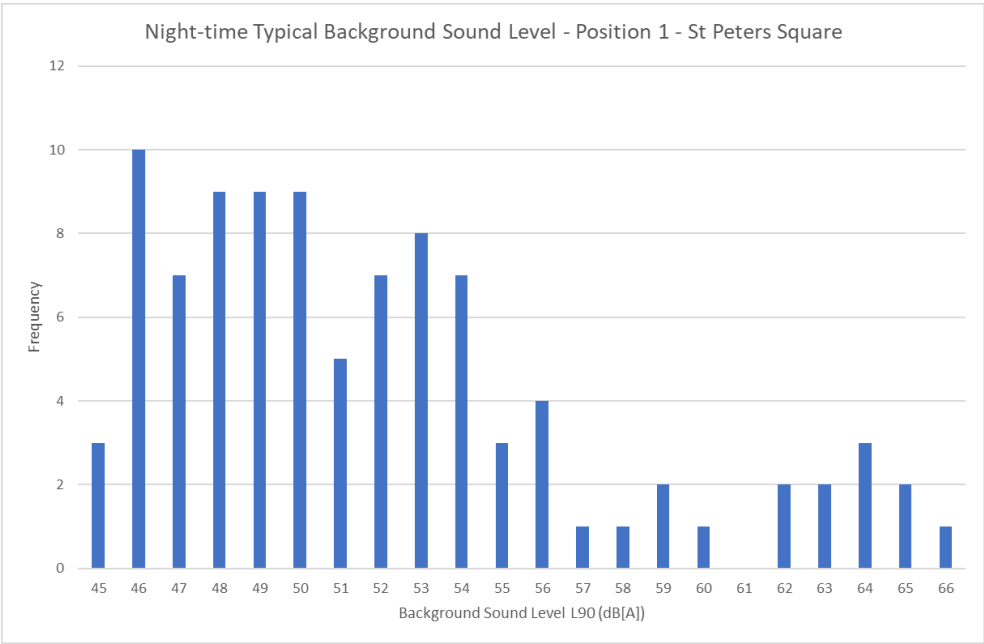


**Figure 13. Typical Background Sound Level – Position 2 – Day-time**

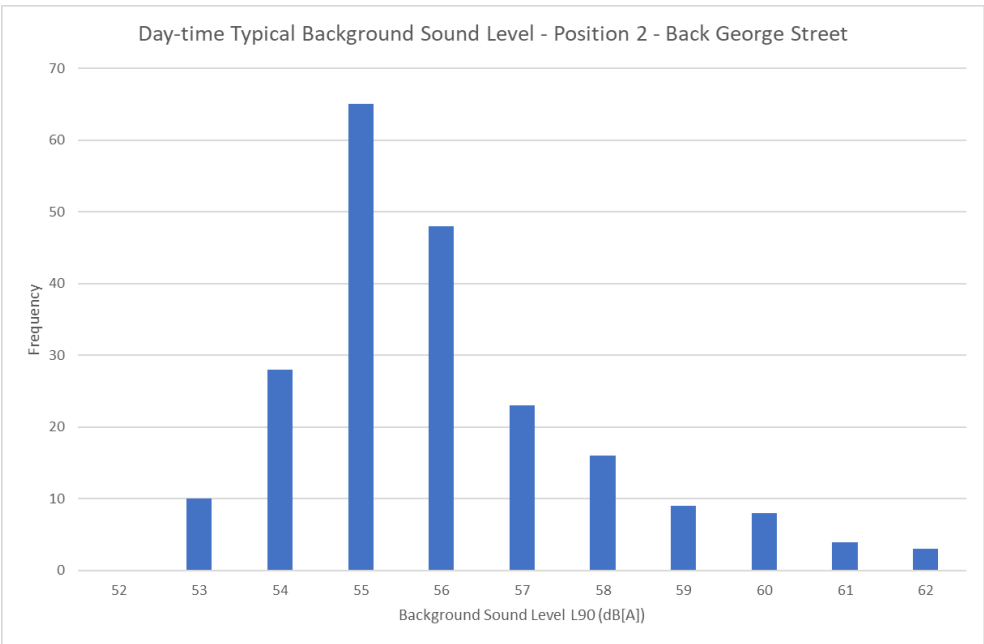


**Figure 14. Typical Background Sound Level – Position 2 – Night-time**

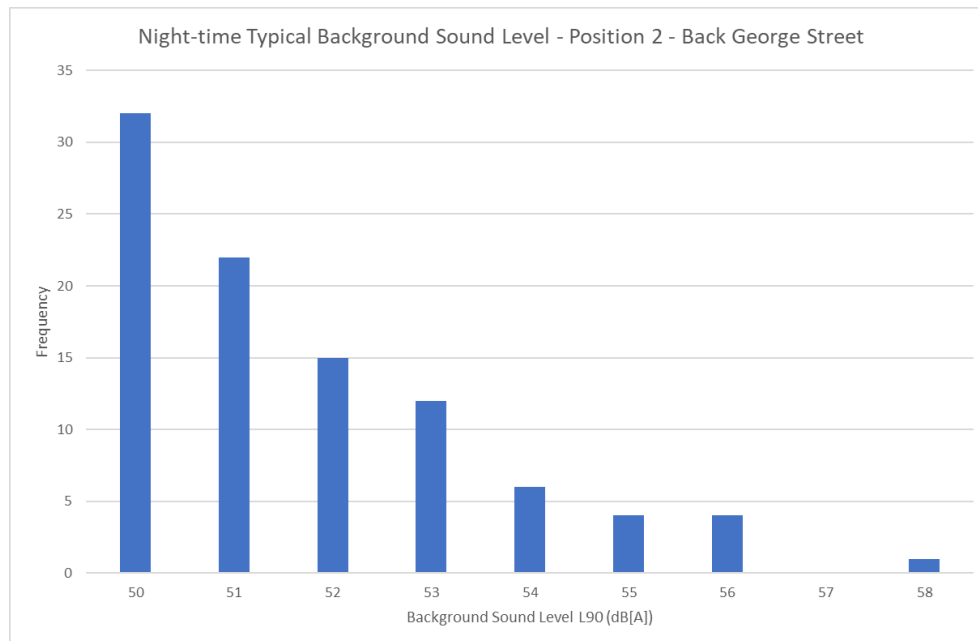


**Table 13. Position 1 – Raw L90 Data**

| STA<br>RT                |                | STOP                 |                | LAF9<br>0.0% | LZF9<br>0.0% | LZF9<br>0.0% | LZF9<br>0.0% | LZF9<br>0.0% | LZF9<br>0.0% | LZF9<br>0.0% | LZF9<br>0.0% | LZF9<br>0.0% |
|--------------------------|----------------|----------------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| DAT<br>E                 | TIME           | DATE                 | TIME           |              | 63           | 125          | 250          | 500          | 1000         | 2000         | 4000         | 8000         |
| [YYY<br>Y-<br>MM-<br>DD] | [HH:M<br>M:SS] | [YYYY<br>-MM-<br>DD] | [HH:M<br>M:SS] | [DB]         | [DB]         | [DB]         | [DB]         | [DB]         | [DB]         | [DB]         | [DB]         | [DB]         |
| ####<br>####             | 10:46:1<br>2   | 06/02/<br>2023       | 10:50:<br>00   | 56.1         | 62           | 57           | 54           | 53           | 51           | 47           | 37           | 27           |
| ####<br>####             | 10:50:0<br>0   | 06/02/<br>2023       | 10:55:<br>00   | 57.7         | 63           | 58           | 55           | 54           | 52           | 48           | 39           | 27           |
| ####<br>####             | 10:55:0<br>0   | 06/02/<br>2023       | 11:00:<br>00   | 58.2         | 64           | 58           | 56           | 54           | 54           | 49           | 40           | 28           |
| ####<br>####             | 11:00:0<br>0   | 06/02/<br>2023       | 11:05:<br>00   | 58.2         | 64           | 57           | 56           | 54           | 54           | 50           | 41           | 29           |
| ####<br>####             | 11:05:0<br>0   | 06/02/<br>2023       | 11:10:<br>00   | 56.9         | 64           | 57           | 55           | 53           | 52           | 48           | 40           | 27           |
| ####<br>####             | 11:10:0<br>0   | 06/02/<br>2023       | 11:15:<br>00   | 56.5         | 64           | 57           | 54           | 53           | 51           | 48           | 38           | 27           |
| ####<br>####             | 11:15:0<br>0   | 06/02/<br>2023       | 11:20:<br>00   | 58           | 63           | 58           | 56           | 54           | 53           | 49           | 40           | 29           |
| ####<br>####             | 11:20:0<br>0   | 06/02/<br>2023       | 11:25:<br>00   | 57           | 64           | 57           | 55           | 54           | 52           | 48           | 39           | 28           |
| ####<br>####             | 11:25:0<br>0   | 06/02/<br>2023       | 11:30:<br>00   | 59.3         | 64           | 58           | 56           | 55           | 54           | 51           | 43           | 31           |
| ####<br>####             | 11:30:0<br>0   | 06/02/<br>2023       | 11:35:<br>00   | 57.7         | 63           | 57           | 55           | 53           | 53           | 49           | 38           | 26           |
| ####<br>####             | 11:35:0<br>0   | 06/02/<br>2023       | 11:40:<br>00   | 57.4         | 63           | 58           | 55           | 54           | 52           | 49           | 40           | 28           |
| ####<br>####             | 11:40:0<br>0   | 06/02/<br>2023       | 11:45:<br>00   | 58.5         | 65           | 58           | 55           | 54           | 53           | 50           | 42           | 29           |
| ####<br>####             | 11:45:0<br>0   | 06/02/<br>2023       | 11:50:<br>00   | 57.5         | 63           | 57           | 55           | 53           | 52           | 50           | 39           | 28           |



|      |          |            |          |      |    |    |    |    |    |    |    |    |
|------|----------|------------|----------|------|----|----|----|----|----|----|----|----|
| #### | 11:50:00 | 06/02/2023 | 11:55:00 | 58.5 | 65 | 58 | 55 | 54 | 53 | 51 | 40 | 28 |
| #### | 11:55:00 | 06/02/2023 | 12:00:00 | 58   | 64 | 58 | 55 | 54 | 53 | 49 | 40 | 29 |
| #### | 12:00:00 | 06/02/2023 | 12:05:00 | 59.1 | 63 | 57 | 55 | 56 | 53 | 50 | 43 | 31 |
| #### | 12:05:00 | 06/02/2023 | 12:10:00 | 59.6 | 65 | 58 | 56 | 57 | 55 | 51 | 43 | 32 |
| #### | 12:10:00 | 06/02/2023 | 12:15:00 | 59.9 | 64 | 58 | 57 | 57 | 55 | 51 | 44 | 31 |
| #### | 12:15:00 | 06/02/2023 | 12:20:00 | 58.1 | 64 | 58 | 55 | 55 | 53 | 49 | 41 | 30 |
| #### | 12:20:00 | 06/02/2023 | 12:25:00 | 58.1 | 62 | 57 | 55 | 55 | 54 | 48 | 40 | 29 |
| #### | 12:25:00 | 06/02/2023 | 12:30:00 | 60.3 | 65 | 58 | 56 | 57 | 55 | 52 | 43 | 32 |
| #### | 12:30:00 | 06/02/2023 | 12:35:00 | 58.8 | 63 | 58 | 55 | 55 | 54 | 50 | 42 | 31 |
| #### | 12:35:00 | 06/02/2023 | 12:40:00 | 57.1 | 62 | 56 | 54 | 54 | 52 | 48 | 40 | 30 |
| #### | 12:40:00 | 06/02/2023 | 12:45:00 | 57.3 | 61 | 58 | 55 | 54 | 52 | 48 | 39 | 29 |
| #### | 12:45:00 | 06/02/2023 | 12:50:00 | 58.6 | 64 | 58 | 56 | 56 | 53 | 49 | 41 | 31 |
| #### | 12:50:00 | 06/02/2023 | 12:55:00 | 59.1 | 64 | 59 | 56 | 56 | 54 | 50 | 42 | 31 |
| #### | 12:55:00 | 06/02/2023 | 13:00:00 | 58.1 | 64 | 57 | 55 | 55 | 53 | 50 | 39 | 29 |
| #### | 13:00:00 | 06/02/2023 | 13:05:00 | 56.4 | 60 | 56 | 54 | 53 | 51 | 47 | 38 | 28 |
| #### | 13:05:00 | 06/02/2023 | 13:10:00 | 59.1 | 66 | 59 | 56 | 56 | 54 | 50 | 41 | 30 |
| #### | 13:10:00 | 06/02/2023 | 13:15:00 | 57.9 | 61 | 56 | 55 | 55 | 53 | 49 | 39 | 29 |
| #### | 13:15:00 | 06/02/2023 | 13:20:00 | 59.2 | 62 | 57 | 57 | 56 | 54 | 50 | 42 | 32 |
| #### | 13:20:00 | 06/02/2023 | 13:25:00 | 58.7 | 62 | 57 | 55 | 55 | 54 | 50 | 41 | 31 |
| #### | 13:25:00 | 06/02/2023 | 13:30:00 | 59.7 | 62 | 56 | 56 | 56 | 55 | 52 | 43 | 31 |
| #### | 13:30:00 | 06/02/2023 | 13:35:00 | 59.2 | 64 | 57 | 56 | 55 | 54 | 51 | 42 | 31 |
| #### | 13:35:00 | 06/02/2023 | 13:40:00 | 57.1 | 60 | 57 | 54 | 54 | 52 | 48 | 39 | 29 |
| #### | 13:40:00 | 06/02/2023 | 13:45:00 | 60.3 | 65 | 58 | 57 | 57 | 56 | 52 | 44 | 33 |
| #### | 13:45:00 | 06/02/2023 | 13:50:00 | 58.5 | 63 | 57 | 56 | 55 | 54 | 49 | 41 | 31 |
| #### | 13:50:00 | 06/02/2023 | 13:55:00 | 57.8 | 62 | 57 | 55 | 54 | 53 | 49 | 40 | 29 |
| #### | 13:55:00 | 06/02/2023 | 14:00:00 | 58.5 | 62 | 56 | 55 | 55 | 54 | 50 | 40 | 29 |
| #### | 14:00:00 | 06/02/2023 | 14:05:00 | 57.4 | 62 | 58 | 55 | 55 | 52 | 48 | 39 | 29 |
| #### | 14:05:00 | 06/02/2023 | 14:10:00 | 57.9 | 63 | 57 | 55 | 55 | 52 | 49 | 40 | 30 |
| #### | 14:10:00 | 06/02/2023 | 14:15:00 | 59   | 63 | 57 | 56 | 55 | 54 | 51 | 41 | 30 |
| #### | 14:15:00 | 06/02/2023 | 14:20:00 | 57   | 61 | 57 | 54 | 54 | 52 | 50 | 40 | 29 |
| #### | 14:20:00 | 06/02/2023 | 14:25:00 | 56.5 | 60 | 55 | 54 | 53 | 51 | 48 | 39 | 29 |



|      |          |            |          |      |    |    |    |    |    |    |    |    |
|------|----------|------------|----------|------|----|----|----|----|----|----|----|----|
| #### | 14:25:00 | 06/02/2023 | 14:30:00 | 59.2 | 62 | 58 | 56 | 55 | 54 | 50 | 42 | 31 |
| #### | 14:30:00 | 06/02/2023 | 14:35:00 | 57.8 | 61 | 56 | 55 | 55 | 53 | 48 | 40 | 30 |
| #### | 14:35:00 | 06/02/2023 | 14:40:00 | 59.3 | 64 | 58 | 55 | 55 | 54 | 52 | 43 | 30 |
| #### | 14:40:00 | 06/02/2023 | 14:45:00 | 57.4 | 63 | 57 | 54 | 53 | 52 | 49 | 40 | 29 |
| #### | 14:45:00 | 06/02/2023 | 14:50:00 | 58.2 | 62 | 57 | 55 | 54 | 53 | 50 | 40 | 30 |
| #### | 14:50:00 | 06/02/2023 | 14:55:00 | 60   | 63 | 58 | 56 | 55 | 55 | 52 | 43 | 30 |
| #### | 14:55:00 | 06/02/2023 | 15:00:00 | 58.3 | 63 | 58 | 56 | 55 | 53 | 50 | 40 | 29 |
| #### | 15:00:00 | 06/02/2023 | 15:05:00 | 58.8 | 62 | 58 | 55 | 55 | 54 | 51 | 42 | 30 |
| #### | 15:05:00 | 06/02/2023 | 15:10:00 | 57.6 | 62 | 57 | 55 | 55 | 53 | 49 | 41 | 31 |
| #### | 15:10:00 | 06/02/2023 | 15:15:00 | 56.9 | 60 | 57 | 54 | 54 | 52 | 48 | 41 | 31 |
| #### | 15:15:00 | 06/02/2023 | 15:20:00 | 60.9 | 65 | 59 | 57 | 57 | 56 | 53 | 44 | 33 |
| #### | 15:20:00 | 06/02/2023 | 15:25:00 | 57.8 | 61 | 57 | 55 | 55 | 53 | 49 | 41 | 31 |
| #### | 15:25:00 | 06/02/2023 | 15:30:00 | 55.1 | 60 | 57 | 54 | 52 | 50 | 45 | 38 | 29 |
| #### | 15:30:00 | 06/02/2023 | 15:35:00 | 60.5 | 65 | 60 | 56 | 57 | 55 | 52 | 42 | 33 |
| #### | 15:35:00 | 06/02/2023 | 15:40:00 | 60.2 | 64 | 59 | 57 | 57 | 56 | 51 | 42 | 31 |
| #### | 15:40:00 | 06/02/2023 | 15:45:00 | 59.4 | 62 | 58 | 55 | 56 | 55 | 51 | 41 | 31 |
| #### | 15:45:00 | 06/02/2023 | 15:50:00 | 57.1 | 61 | 57 | 55 | 54 | 52 | 48 | 39 | 29 |
| #### | 15:50:00 | 06/02/2023 | 15:55:00 | 58.7 | 63 | 58 | 55 | 55 | 54 | 50 | 41 | 30 |
| #### | 15:55:00 | 06/02/2023 | 16:00:00 | 57.1 | 61 | 57 | 55 | 54 | 52 | 48 | 39 | 29 |
| #### | 16:00:00 | 06/02/2023 | 16:05:00 | 58.4 | 61 | 57 | 55 | 55 | 53 | 50 | 40 | 30 |
| #### | 16:05:00 | 06/02/2023 | 16:10:00 | 58.6 | 64 | 59 | 56 | 55 | 53 | 50 | 41 | 31 |
| #### | 16:10:00 | 06/02/2023 | 16:15:00 | 58.4 | 64 | 58 | 56 | 55 | 53 | 49 | 41 | 32 |
| #### | 16:15:00 | 06/02/2023 | 16:20:00 | 57.7 | 62 | 57 | 55 | 54 | 53 | 49 | 39 | 30 |
| #### | 16:20:00 | 06/02/2023 | 16:25:00 | 58.6 | 62 | 57 | 55 | 55 | 54 | 50 | 41 | 31 |
| #### | 16:25:00 | 06/02/2023 | 16:30:00 | 57.9 | 61 | 57 | 55 | 54 | 53 | 49 | 41 | 30 |
| #### | 16:30:00 | 06/02/2023 | 16:35:00 | 59.5 | 64 | 58 | 56 | 55 | 54 | 51 | 43 | 31 |
| #### | 16:35:00 | 06/02/2023 | 16:40:00 | 58.1 | 61 | 57 | 55 | 55 | 52 | 49 | 40 | 31 |
| #### | 16:40:00 | 06/02/2023 | 16:45:00 | 58.8 | 64 | 58 | 56 | 55 | 54 | 49 | 41 | 32 |
| #### | 16:45:00 | 06/02/2023 | 16:50:00 | 57.5 | 60 | 57 | 55 | 55 | 53 | 48 | 40 | 31 |
| #### | 16:50:00 | 06/02/2023 | 16:55:00 | 60.6 | 65 | 59 | 57 | 57 | 55 | 52 | 43 | 32 |
| #### | 16:55:00 | 06/02/2023 | 17:00:00 | 57.5 | 60 | 56 | 56 | 54 | 52 | 49 | 40 | 31 |



|      |          |            |          |      |    |    |    |    |    |    |    |    |
|------|----------|------------|----------|------|----|----|----|----|----|----|----|----|
| #### | 17:00:00 | 06/02/2023 | 17:05:00 | 58.9 | 61 | 57 | 55 | 55 | 54 | 51 | 41 | 31 |
| #### | 17:05:00 | 06/02/2023 | 17:10:00 | 60.6 | 63 | 59 | 57 | 58 | 55 | 52 | 43 | 35 |
| #### | 17:10:00 | 06/02/2023 | 17:15:00 | 59.5 | 63 | 58 | 57 | 57 | 54 | 51 | 41 | 32 |
| #### | 17:15:00 | 06/02/2023 | 17:20:00 | 59.1 | 62 | 58 | 56 | 56 | 54 | 50 | 42 | 33 |
| #### | 17:20:00 | 06/02/2023 | 17:25:00 | 59.3 | 63 | 57 | 56 | 56 | 54 | 51 | 42 | 32 |
| #### | 17:25:00 | 06/02/2023 | 17:30:00 | 59.9 | 64 | 59 | 57 | 56 | 55 | 52 | 43 | 33 |
| #### | 17:30:00 | 06/02/2023 | 17:35:00 | 58.6 | 61 | 58 | 56 | 55 | 54 | 49 | 41 | 32 |
| #### | 17:35:00 | 06/02/2023 | 17:40:00 | 59.8 | 63 | 58 | 57 | 57 | 55 | 51 | 43 | 33 |
| #### | 17:40:00 | 06/02/2023 | 17:45:00 | 59.1 | 62 | 57 | 56 | 57 | 54 | 50 | 42 | 32 |
| #### | 17:45:00 | 06/02/2023 | 17:50:00 | 59.9 | 64 | 58 | 57 | 57 | 55 | 51 | 42 | 33 |
| #### | 17:50:00 | 06/02/2023 | 17:55:00 | 58.6 | 63 | 59 | 56 | 56 | 53 | 49 | 41 | 32 |
| #### | 17:55:00 | 06/02/2023 | 18:00:00 | 58.9 | 63 | 58 | 56 | 55 | 54 | 50 | 41 | 31 |
| #### | 18:00:00 | 06/02/2023 | 18:05:00 | 58.5 | 62 | 58 | 55 | 56 | 54 | 50 | 41 | 32 |
| #### | 18:05:00 | 06/02/2023 | 18:10:00 | 59.1 | 64 | 58 | 56 | 56 | 54 | 50 | 41 | 32 |
| #### | 18:10:00 | 06/02/2023 | 18:15:00 | 57.6 | 61 | 57 | 55 | 55 | 52 | 48 | 40 | 30 |
| #### | 18:15:00 | 06/02/2023 | 18:20:00 | 59.4 | 64 | 59 | 56 | 56 | 54 | 52 | 42 | 31 |
| #### | 18:20:00 | 06/02/2023 | 18:25:00 | 57.5 | 61 | 56 | 55 | 54 | 52 | 49 | 39 | 29 |
| #### | 18:25:00 | 06/02/2023 | 18:30:00 | 59.7 | 63 | 58 | 56 | 56 | 55 | 52 | 42 | 32 |
| #### | 18:30:00 | 06/02/2023 | 18:35:00 | 58.6 | 62 | 57 | 55 | 56 | 53 | 50 | 41 | 31 |
| #### | 18:35:00 | 06/02/2023 | 18:40:00 | 59.4 | 63 | 58 | 55 | 56 | 54 | 50 | 40 | 28 |
| #### | 18:40:00 | 06/02/2023 | 18:45:00 | 56.8 | 60 | 58 | 54 | 54 | 52 | 47 | 38 | 28 |
| #### | 18:45:00 | 06/02/2023 | 18:50:00 | 58.1 | 61 | 57 | 55 | 55 | 53 | 49 | 40 | 30 |
| #### | 18:50:00 | 06/02/2023 | 18:55:00 | 58.7 | 62 | 57 | 55 | 55 | 54 | 50 | 40 | 29 |
| #### | 18:55:00 | 06/02/2023 | 19:00:00 | 59.1 | 62 | 58 | 56 | 56 | 54 | 50 | 41 | 30 |
| #### | 19:00:00 | 06/02/2023 | 19:05:00 | 57.1 | 60 | 56 | 54 | 54 | 52 | 48 | 39 | 29 |
| #### | 19:05:00 | 06/02/2023 | 19:10:00 | 57.7 | 63 | 57 | 54 | 54 | 53 | 48 | 40 | 30 |
| #### | 19:10:00 | 06/02/2023 | 19:15:00 | 56.8 | 62 | 57 | 54 | 54 | 52 | 48 | 39 | 28 |
| #### | 19:15:00 | 06/02/2023 | 19:20:00 | 59.1 | 63 | 57 | 55 | 55 | 53 | 51 | 42 | 30 |
| #### | 19:20:00 | 06/02/2023 | 19:25:00 | 56   | 58 | 56 | 53 | 53 | 51 | 46 | 38 | 27 |
| #### | 19:25:00 | 06/02/2023 | 19:30:00 | 58.1 | 61 | 56 | 54 | 54 | 53 | 51 | 40 | 28 |
| #### | 19:30:00 | 06/02/2023 | 19:35:00 | 58.7 | 61 | 57 | 55 | 55 | 54 | 51 | 40 | 28 |



|              |              |                |              |      |    |    |    |    |    |    |    |    |
|--------------|--------------|----------------|--------------|------|----|----|----|----|----|----|----|----|
| ####<br>#### | 19:35:0<br>0 | 06/02/<br>2023 | 19:40:<br>00 | 56.8 | 60 | 57 | 53 | 54 | 52 | 47 | 38 | 29 |
| ####<br>#### | 19:40:0<br>0 | 06/02/<br>2023 | 19:45:<br>00 | 56.3 | 61 | 56 | 54 | 54 | 51 | 46 | 38 | 28 |
| ####<br>#### | 19:45:0<br>0 | 06/02/<br>2023 | 19:50:<br>00 | 56.1 | 61 | 57 | 54 | 53 | 51 | 46 | 37 | 27 |
| ####<br>#### | 19:50:0<br>0 | 06/02/<br>2023 | 19:55:<br>00 | 56.7 | 61 | 57 | 54 | 54 | 52 | 47 | 37 | 26 |
| ####<br>#### | 19:55:0<br>0 | 06/02/<br>2023 | 20:00:<br>00 | 56.8 | 62 | 57 | 54 | 54 | 51 | 48 | 38 | 28 |
| ####<br>#### | 20:00:0<br>0 | 06/02/<br>2023 | 20:05:<br>00 | 54.7 | 61 | 56 | 52 | 51 | 50 | 45 | 36 | 27 |
| ####<br>#### | 20:05:0<br>0 | 06/02/<br>2023 | 20:10:<br>00 | 57.8 | 63 | 58 | 55 | 54 | 53 | 49 | 39 | 28 |
| ####<br>#### | 20:10:0<br>0 | 06/02/<br>2023 | 20:15:<br>00 | 56.9 | 62 | 56 | 53 | 53 | 52 | 48 | 38 | 28 |
| ####<br>#### | 20:15:0<br>0 | 06/02/<br>2023 | 20:20:<br>00 | 57.6 | 60 | 56 | 54 | 54 | 52 | 49 | 39 | 28 |
| ####<br>#### | 20:20:0<br>0 | 06/02/<br>2023 | 20:25:<br>00 | 54.9 | 62 | 58 | 53 | 52 | 50 | 45 | 37 | 26 |
| ####<br>#### | 20:25:0<br>0 | 06/02/<br>2023 | 20:30:<br>00 | 57.1 | 61 | 56 | 53 | 53 | 52 | 48 | 40 | 26 |
| ####<br>#### | 20:30:0<br>0 | 06/02/<br>2023 | 20:35:<br>00 | 54.3 | 59 | 56 | 52 | 51 | 49 | 44 | 35 | 25 |
| ####<br>#### | 20:35:0<br>0 | 06/02/<br>2023 | 20:40:<br>00 | 56.1 | 61 | 56 | 53 | 53 | 51 | 46 | 36 | 25 |
| ####<br>#### | 20:40:0<br>0 | 06/02/<br>2023 | 20:45:<br>00 | 56.7 | 61 | 56 | 52 | 53 | 51 | 48 | 38 | 26 |
| ####<br>#### | 20:45:0<br>0 | 06/02/<br>2023 | 20:50:<br>00 | 53.7 | 59 | 57 | 51 | 51 | 49 | 43 | 34 | 24 |
| ####<br>#### | 20:50:0<br>0 | 06/02/<br>2023 | 20:55:<br>00 | 56.1 | 60 | 56 | 53 | 53 | 51 | 47 | 38 | 27 |
| ####<br>#### | 20:55:0<br>0 | 06/02/<br>2023 | 21:00:<br>00 | 55.3 | 60 | 55 | 52 | 51 | 50 | 47 | 36 | 24 |
| ####<br>#### | 21:00:0<br>0 | 06/02/<br>2023 | 21:05:<br>00 | 53.6 | 58 | 55 | 51 | 50 | 49 | 44 | 34 | 25 |
| ####<br>#### | 21:05:0<br>0 | 06/02/<br>2023 | 21:10:<br>00 | 52.9 | 59 | 55 | 51 | 50 | 48 | 43 | 34 | 24 |
| ####<br>#### | 21:10:0<br>0 | 06/02/<br>2023 | 21:15:<br>00 | 56   | 61 | 56 | 53 | 52 | 51 | 47 | 36 | 25 |
| ####<br>#### | 21:15:0<br>0 | 06/02/<br>2023 | 21:20:<br>00 | 51.9 | 58 | 56 | 50 | 49 | 47 | 41 | 32 | 23 |
| ####<br>#### | 21:20:0<br>0 | 06/02/<br>2023 | 21:25:<br>00 | 52.6 | 59 | 55 | 52 | 50 | 48 | 42 | 32 | 22 |
| ####<br>#### | 21:25:0<br>0 | 06/02/<br>2023 | 21:30:<br>00 | 55.5 | 61 | 55 | 52 | 52 | 51 | 46 | 37 | 25 |
| ####<br>#### | 21:30:0<br>0 | 06/02/<br>2023 | 21:35:<br>00 | 53.3 | 57 | 55 | 51 | 50 | 48 | 43 | 33 | 22 |
| ####<br>#### | 21:35:0<br>0 | 06/02/<br>2023 | 21:40:<br>00 | 55.4 | 60 | 55 | 52 | 52 | 51 | 47 | 37 | 24 |
| ####<br>#### | 21:40:0<br>0 | 06/02/<br>2023 | 21:45:<br>00 | 55.3 | 61 | 56 | 52 | 52 | 50 | 46 | 36 | 24 |
| ####<br>#### | 21:45:0<br>0 | 06/02/<br>2023 | 21:50:<br>00 | 52.7 | 58 | 55 | 51 | 50 | 48 | 42 | 32 | 22 |
| ####<br>#### | 21:50:0<br>0 | 06/02/<br>2023 | 21:55:<br>00 | 57.8 | 63 | 57 | 54 | 56 | 52 | 48 | 39 | 25 |
| ####<br>#### | 21:55:0<br>0 | 06/02/<br>2023 | 22:00:<br>00 | 57.8 | 64 | 57 | 53 | 56 | 52 | 48 | 39 | 24 |
| ####<br>#### | 22:00:0<br>0 | 06/02/<br>2023 | 22:05:<br>00 | 57.7 | 64 | 58 | 53 | 56 | 52 | 48 | 39 | 23 |
| ####<br>#### | 22:05:0<br>0 | 06/02/<br>2023 | 22:10:<br>00 | 57.4 | 64 | 57 | 52 | 55 | 52 | 48 | 38 | 24 |



|      |          |            |          |      |    |    |    |    |    |    |    |    |
|------|----------|------------|----------|------|----|----|----|----|----|----|----|----|
| #### | 22:10:00 | 06/02/2023 | 22:15:00 | 58.4 | 65 | 58 | 54 | 56 | 53 | 49 | 39 | 26 |
| #### | 22:15:00 | 06/02/2023 | 22:20:00 | 54.3 | 61 | 54 | 52 | 51 | 49 | 45 | 36 | 25 |
| #### | 22:20:00 | 06/02/2023 | 22:25:00 | 57.4 | 64 | 56 | 54 | 54 | 53 | 49 | 41 | 28 |
| #### | 22:25:00 | 06/02/2023 | 22:30:00 | 56.5 | 62 | 56 | 53 | 54 | 51 | 47 | 38 | 26 |
| #### | 22:30:00 | 06/02/2023 | 22:35:00 | 56.5 | 67 | 56 | 52 | 52 | 52 | 48 | 41 | 26 |
| #### | 22:35:00 | 06/02/2023 | 22:40:00 | 57.4 | 69 | 56 | 53 | 53 | 53 | 50 | 41 | 26 |
| #### | 22:40:00 | 06/02/2023 | 22:45:00 | 53.1 | 60 | 55 | 50 | 50 | 49 | 44 | 35 | 23 |
| #### | 22:45:00 | 06/02/2023 | 22:50:00 | 57.2 | 63 | 56 | 53 | 54 | 52 | 48 | 39 | 24 |
| #### | 22:50:00 | 06/02/2023 | 22:55:00 | 57.4 | 66 | 58 | 53 | 55 | 52 | 48 | 38 | 24 |
| #### | 22:55:00 | 06/02/2023 | 23:00:00 | 54.7 | 61 | 57 | 51 | 51 | 50 | 45 | 34 | 23 |
| #### | 23:00:00 | 06/02/2023 | 23:05:00 | 54.3 | 65 | 58 | 53 | 55 | 53 | 50 | 40 | 26 |
| #### | 07:00:00 | 07/02/2023 | 07:05:00 | 53.1 | 61 | 56 | 53 | 50 | 50 | 45 | 37 | 24 |
| #### | 07:05:00 | 07/02/2023 | 07:10:00 | 54.8 | 61 | 56 | 52 | 50 | 48 | 44 | 34 | 23 |
| #### | 07:10:00 | 07/02/2023 | 07:15:00 | 57.2 | 61 | 57 | 53 | 51 | 50 | 46 | 36 | 25 |
| #### | 07:15:00 | 07/02/2023 | 07:20:00 | 53   | 65 | 58 | 55 | 53 | 52 | 49 | 40 | 29 |
| #### | 07:20:00 | 07/02/2023 | 07:25:00 | 54.8 | 62 | 56 | 52 | 49 | 48 | 44 | 34 | 24 |
| #### | 07:25:00 | 07/02/2023 | 07:30:00 | 53   | 61 | 56 | 53 | 52 | 50 | 46 | 36 | 26 |
| #### | 07:30:00 | 07/02/2023 | 07:35:00 | 56.9 | 60 | 55 | 52 | 50 | 48 | 44 | 33 | 25 |
| #### | 07:35:00 | 07/02/2023 | 07:40:00 | 57.9 | 64 | 57 | 55 | 53 | 51 | 48 | 39 | 27 |
| #### | 07:40:00 | 07/02/2023 | 07:45:00 | 55.9 | 65 | 59 | 55 | 54 | 53 | 50 | 42 | 29 |
| #### | 07:45:00 | 07/02/2023 | 07:50:00 | 56.5 | 63 | 57 | 54 | 52 | 51 | 47 | 38 | 28 |
| #### | 07:50:00 | 07/02/2023 | 07:55:00 | 57.3 | 63 | 57 | 55 | 53 | 51 | 48 | 39 | 29 |
| #### | 07:55:00 | 07/02/2023 | 08:00:00 | 55.8 | 62 | 57 | 54 | 53 | 53 | 49 | 40 | 29 |
| #### | 08:00:00 | 07/02/2023 | 08:05:00 | 58.4 | 62 | 57 | 56 | 53 | 51 | 46 | 37 | 27 |
| #### | 08:05:00 | 07/02/2023 | 08:10:00 | 56.1 | 63 | 57 | 55 | 54 | 54 | 50 | 41 | 31 |
| #### | 08:10:00 | 07/02/2023 | 08:15:00 | 57.6 | 63 | 57 | 54 | 53 | 51 | 47 | 38 | 28 |
| #### | 08:15:00 | 07/02/2023 | 08:20:00 | 57.4 | 63 | 58 | 55 | 53 | 53 | 49 | 40 | 30 |
| #### | 08:20:00 | 07/02/2023 | 08:25:00 | 58.2 | 63 | 58 | 55 | 53 | 53 | 49 | 40 | 32 |
| #### | 08:25:00 | 07/02/2023 | 08:30:00 | 56.8 | 64 | 57 | 55 | 54 | 54 | 50 | 41 | 31 |
| #### | 08:30:00 | 07/02/2023 | 08:35:00 | 58.4 | 62 | 57 | 54 | 53 | 52 | 48 | 40 | 30 |
| #### | 08:35:00 | 07/02/2023 | 08:40:00 | 62   | 62 | 57 | 55 | 54 | 53 | 50 | 43 | 31 |



|              |              |                |              |      |    |    |    |    |    |    |    |    |
|--------------|--------------|----------------|--------------|------|----|----|----|----|----|----|----|----|
| ####<br>#### | 08:40:0<br>0 | 07/02/<br>2023 | 08:45:<br>00 | 56.7 | 67 | 60 | 58 | 57 | 57 | 54 | 47 | 35 |
| ####<br>#### | 08:45:0<br>0 | 07/02/<br>2023 | 08:50:<br>00 | 56.4 | 62 | 56 | 55 | 53 | 52 | 47 | 39 | 30 |
| ####<br>#### | 08:50:0<br>0 | 07/02/<br>2023 | 08:55:<br>00 | 60.3 | 61 | 56 | 55 | 53 | 51 | 47 | 39 | 30 |
| ####<br>#### | 08:55:0<br>0 | 07/02/<br>2023 | 09:00:<br>00 | 59.8 | 66 | 59 | 57 | 55 | 55 | 53 | 46 | 34 |
| ####<br>#### | 09:00:0<br>0 | 07/02/<br>2023 | 09:05:<br>00 | 57.4 | 65 | 59 | 57 | 55 | 55 | 51 | 43 | 32 |
| ####<br>#### | 09:05:0<br>0 | 07/02/<br>2023 | 09:10:<br>00 | 57.6 | 64 | 58 | 55 | 53 | 52 | 49 | 40 | 30 |
| ####<br>#### | 09:10:0<br>0 | 07/02/<br>2023 | 09:15:<br>00 | 57.9 | 63 | 57 | 55 | 54 | 53 | 49 | 41 | 30 |
| ####<br>#### | 09:15:0<br>0 | 07/02/<br>2023 | 09:20:<br>00 | 56.2 | 64 | 57 | 55 | 53 | 53 | 50 | 42 | 31 |
| ####<br>#### | 09:20:0<br>0 | 07/02/<br>2023 | 09:25:<br>00 | 57.8 | 62 | 56 | 54 | 53 | 52 | 48 | 39 | 28 |
| ####<br>#### | 09:25:0<br>0 | 07/02/<br>2023 | 09:30:<br>00 | 59.3 | 63 | 59 | 56 | 54 | 53 | 48 | 41 | 31 |
| ####<br>#### | 09:30:0<br>0 | 07/02/<br>2023 | 09:35:<br>00 | 57.7 | 66 | 59 | 56 | 55 | 54 | 52 | 43 | 30 |
| ####<br>#### | 09:35:0<br>0 | 07/02/<br>2023 | 09:40:<br>00 | 59.2 | 63 | 58 | 55 | 54 | 52 | 48 | 39 | 28 |
| ####<br>#### | 09:40:0<br>0 | 07/02/<br>2023 | 09:45:<br>00 | 58.1 | 65 | 59 | 56 | 55 | 54 | 50 | 42 | 30 |
| ####<br>#### | 09:45:0<br>0 | 07/02/<br>2023 | 09:50:<br>00 | 58   | 64 | 58 | 56 | 55 | 53 | 49 | 42 | 30 |
| ####<br>#### | 09:50:0<br>0 | 07/02/<br>2023 | 09:55:<br>00 | 57.7 | 63 | 58 | 55 | 54 | 53 | 49 | 41 | 29 |
| ####<br>#### | 09:55:0<br>0 | 07/02/<br>2023 | 10:00:<br>00 | 58.1 | 63 | 57 | 55 | 54 | 53 | 49 | 41 | 29 |
| ####<br>#### | 10:00:0<br>0 | 07/02/<br>2023 | 10:05:<br>00 | 58   | 63 | 57 | 55 | 54 | 53 | 49 | 41 | 30 |
| ####<br>#### | 10:05:0<br>0 | 07/02/<br>2023 | 10:10:<br>00 | 56.8 | 63 | 58 | 55 | 55 | 53 | 49 | 40 | 31 |
| ####<br>#### | 10:10:0<br>0 | 07/02/<br>2023 | 10:15:<br>00 | 58.5 | 62 | 57 | 55 | 53 | 52 | 47 | 39 | 29 |
| ####<br>#### | 10:15:0<br>0 | 07/02/<br>2023 | 10:20:<br>00 | 58.5 | 64 | 58 | 56 | 54 | 53 | 50 | 43 | 31 |
| ####<br>#### | 10:20:0<br>0 | 07/02/<br>2023 | 10:25:<br>00 | 57.9 | 63 | 58 | 54 | 53 | 53 | 52 | 43 | 29 |
| ####<br>#### | 10:25:0<br>0 | 07/02/<br>2023 | 10:30:<br>00 | 57.8 | 64 | 58 | 55 | 54 | 53 | 50 | 41 | 29 |
| ####<br>#### | 10:30:0<br>0 | 07/02/<br>2023 | 10:35:<br>00 | 58.5 | 63 | 57 | 55 | 54 | 53 | 50 | 40 | 30 |
| ####<br>#### | 10:35:0<br>0 | 07/02/<br>2023 | 10:40:<br>00 | 58.4 | 63 | 58 | 56 | 54 | 54 | 50 | 43 | 31 |
| ####<br>#### | 10:40:0<br>0 | 07/02/<br>2023 | 10:45:<br>00 | 58   | 64 | 58 | 56 | 55 | 53 | 49 | 40 | 29 |
| ####<br>#### | 10:45:0<br>0 | 07/02/<br>2023 | 10:50:<br>00 | 57.5 | 64 | 58 | 55 | 54 | 53 | 49 | 41 | 30 |
| ####<br>#### | 10:50:0<br>0 | 07/02/<br>2023 | 10:55:<br>00 | 56   | 63 | 58 | 54 | 54 | 53 | 48 | 39 | 29 |
| ####<br>#### | 10:55:0<br>0 | 07/02/<br>2023 | 11:00:<br>00 | 58.9 | 63 | 57 | 54 | 52 | 51 | 48 | 37 | 27 |
| ####<br>#### | 11:00:0<br>0 | 07/02/<br>2023 | 11:05:<br>00 | 57.9 | 63 | 58 | 55 | 55 | 54 | 51 | 42 | 30 |
| ####<br>#### | 11:05:0<br>0 | 07/02/<br>2023 | 11:10:<br>00 | 57.6 | 64 | 58 | 56 | 54 | 53 | 49 | 41 | 30 |
| ####<br>#### | 11:10:0<br>0 | 07/02/<br>2023 | 11:15:<br>00 | 57.8 | 63 | 57 | 55 | 54 | 52 | 49 | 41 | 29 |



|      |          |            |          |      |    |    |    |    |    |    |    |    |
|------|----------|------------|----------|------|----|----|----|----|----|----|----|----|
| #### | 11:15:00 | 07/02/2023 | 11:20:00 | 60.6 | 63 | 58 | 55 | 54 | 52 | 50 | 42 | 30 |
| #### | 11:20:00 | 07/02/2023 | 11:25:00 | 58.9 | 65 | 59 | 56 | 55 | 55 | 53 | 45 | 32 |
| #### | 11:25:00 | 07/02/2023 | 11:30:00 | 56.9 | 63 | 58 | 56 | 56 | 54 | 50 | 42 | 32 |
| #### | 11:30:00 | 07/02/2023 | 11:35:00 | 58.8 | 61 | 57 | 54 | 53 | 52 | 48 | 39 | 27 |
| #### | 11:35:00 | 07/02/2023 | 11:40:00 | 58.6 | 63 | 57 | 56 | 55 | 54 | 51 | 43 | 31 |
| #### | 11:40:00 | 07/02/2023 | 11:45:00 | 58.2 | 65 | 58 | 56 | 55 | 54 | 50 | 43 | 31 |
| #### | 11:45:00 | 07/02/2023 | 11:50:00 | 58.4 | 61 | 57 | 56 | 55 | 53 | 49 | 41 | 32 |
| #### | 11:50:00 | 07/02/2023 | 11:55:00 | 57.8 | 62 | 58 | 55 | 55 | 53 | 50 | 41 | 30 |
| #### | 11:55:00 | 07/02/2023 | 12:00:00 | 57.9 | 63 | 58 | 55 | 55 | 53 | 49 | 42 | 29 |
| #### | 12:00:00 | 07/02/2023 | 12:05:00 | 59.4 | 63 | 58 | 55 | 55 | 52 | 49 | 41 | 30 |
| #### | 12:05:00 | 07/02/2023 | 12:10:00 | 57.5 | 63 | 58 | 56 | 56 | 55 | 51 | 43 | 31 |
| #### | 12:10:00 | 07/02/2023 | 12:15:00 | 60.1 | 62 | 58 | 55 | 55 | 52 | 48 | 40 | 30 |
| #### | 12:15:00 | 07/02/2023 | 12:20:00 | 57.5 | 65 | 60 | 56 | 56 | 55 | 52 | 43 | 33 |
| #### | 12:20:00 | 07/02/2023 | 12:25:00 | 57.3 | 63 | 58 | 55 | 54 | 53 | 49 | 40 | 30 |
| #### | 12:25:00 | 07/02/2023 | 12:30:00 | 58.2 | 63 | 58 | 55 | 54 | 52 | 49 | 40 | 31 |
| #### | 12:30:00 | 07/02/2023 | 12:35:00 | 59.2 | 61 | 57 | 55 | 54 | 53 | 50 | 41 | 31 |
| #### | 12:35:00 | 07/02/2023 | 12:40:00 | 58.9 | 63 | 58 | 56 | 56 | 54 | 51 | 42 | 32 |
| #### | 12:40:00 | 07/02/2023 | 12:45:00 | 58.1 | 63 | 58 | 56 | 55 | 54 | 51 | 42 | 31 |
| #### | 23:00:00 | 06/02/2023 | 23:05:00 | 58.2 | 65 | 58 | 53 | 55 | 53 | 50 | 40 | 26 |
| #### | 23:05:00 | 06/02/2023 | 23:10:00 | 55.2 | 64 | 55 | 51 | 51 | 51 | 47 | 38 | 24 |
| #### | 23:10:00 | 06/02/2023 | 23:15:00 | 56   | 62 | 56 | 52 | 52 | 52 | 48 | 38 | 23 |
| #### | 23:15:00 | 06/02/2023 | 23:20:00 | 50.6 | 59 | 54 | 50 | 48 | 46 | 39 | 30 | 20 |
| #### | 23:20:00 | 06/02/2023 | 23:25:00 | 53   | 58 | 54 | 50 | 50 | 47 | 43 | 33 | 22 |
| #### | 23:25:00 | 06/02/2023 | 23:30:00 | 53.3 | 59 | 54 | 50 | 49 | 49 | 43 | 33 | 21 |
| #### | 23:30:00 | 06/02/2023 | 23:35:00 | 48.9 | 55 | 52 | 48 | 46 | 44 | 37 | 27 | 18 |
| #### | 23:35:00 | 06/02/2023 | 23:40:00 | 51.6 | 59 | 56 | 50 | 48 | 47 | 41 | 32 | 21 |
| #### | 23:40:00 | 06/02/2023 | 23:45:00 | 49.7 | 58 | 53 | 49 | 46 | 45 | 39 | 27 | 17 |
| #### | 23:45:00 | 06/02/2023 | 23:50:00 | 49.2 | 57 | 53 | 48 | 46 | 45 | 38 | 28 | 18 |
| #### | 23:50:00 | 06/02/2023 | 23:55:00 | 51.8 | 57 | 53 | 49 | 48 | 47 | 43 | 31 | 20 |
| #### | 23:55:00 | 07/02/2023 | 00:00:00 | 47.6 | 54 | 51 | 47 | 45 | 43 | 35 | 24 | 16 |



|      |          |            |          |      |    |    |    |    |    |    |    |    |
|------|----------|------------|----------|------|----|----|----|----|----|----|----|----|
| #### | 00:00:00 | 07/02/2023 | 00:05:00 | 56.1 | 62 | 57 | 52 | 51 | 51 | 48 | 37 | 22 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 00:05:00 | 07/02/2023 | 00:10:00 | 48.1 | 56 | 52 | 48 | 45 | 43 | 37 | 26 | 17 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 00:10:00 | 07/02/2023 | 00:15:00 | 52.9 | 58 | 53 | 50 | 48 | 47 | 43 | 34 | 19 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 00:15:00 | 07/02/2023 | 00:20:00 | 48.9 | 56 | 52 | 47 | 45 | 44 | 38 | 26 | 18 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 00:20:00 | 07/02/2023 | 00:25:00 | 52.3 | 57 | 53 | 50 | 48 | 47 | 43 | 33 | 19 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 00:25:00 | 07/02/2023 | 00:30:00 | 47.4 | 56 | 53 | 47 | 44 | 42 | 35 | 23 | 16 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 00:30:00 | 07/02/2023 | 00:35:00 | 50.2 | 56 | 52 | 48 | 46 | 45 | 39 | 27 | 16 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 00:35:00 | 07/02/2023 | 00:40:00 | 49.3 | 57 | 52 | 48 | 45 | 45 | 39 | 27 | 17 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 00:40:00 | 07/02/2023 | 00:45:00 | 47.5 | 55 | 52 | 47 | 44 | 43 | 36 | 24 | 16 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 00:45:00 | 07/02/2023 | 00:50:00 | 45.9 | 54 | 51 | 46 | 43 | 41 | 34 | 22 | 16 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 00:50:00 | 07/02/2023 | 00:55:00 | 49.2 | 56 | 52 | 48 | 46 | 45 | 38 | 27 | 17 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 00:55:00 | 07/02/2023 | 01:00:00 | 47.5 | 54 | 51 | 47 | 44 | 43 | 36 | 23 | 16 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 01:00:00 | 07/02/2023 | 01:05:00 | 46.7 | 54 | 51 | 46 | 43 | 42 | 35 | 23 | 16 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 01:05:00 | 07/02/2023 | 01:10:00 | 46.8 | 55 | 51 | 47 | 44 | 42 | 35 | 22 | 16 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 01:10:00 | 07/02/2023 | 01:15:00 | 52.1 | 59 | 56 | 50 | 49 | 48 | 42 | 33 | 22 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 01:15:00 | 07/02/2023 | 01:20:00 | 50.9 | 60 | 56 | 49 | 49 | 46 | 40 | 32 | 21 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 01:20:00 | 07/02/2023 | 01:25:00 | 65.5 | 72 | 58 | 58 | 62 | 59 | 57 | 53 | 44 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 01:25:00 | 07/02/2023 | 01:30:00 | 53   | 60 | 56 | 50 | 50 | 49 | 43 | 34 | 24 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 01:30:00 | 07/02/2023 | 01:35:00 | 50.8 | 58 | 54 | 49 | 48 | 45 | 41 | 32 | 20 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 01:35:00 | 07/02/2023 | 01:40:00 | 49.9 | 57 | 54 | 48 | 47 | 45 | 40 | 32 | 20 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 01:40:00 | 07/02/2023 | 01:45:00 | 49.9 | 58 | 54 | 48 | 47 | 45 | 40 | 32 | 21 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 01:45:00 | 07/02/2023 | 01:50:00 | 65.4 | 74 | 60 | 59 | 63 | 59 | 57 | 52 | 43 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 01:50:00 | 07/02/2023 | 01:55:00 | 50.5 | 58 | 55 | 49 | 48 | 45 | 41 | 31 | 20 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 01:55:00 | 07/02/2023 | 02:00:00 | 64.8 | 68 | 63 | 54 | 56 | 59 | 59 | 56 | 50 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 02:00:00 | 07/02/2023 | 02:05:00 | 64.1 | 66 | 62 | 54 | 57 | 58 | 58 | 55 | 48 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 02:05:00 | 07/02/2023 | 02:10:00 | 59.3 | 65 | 61 | 54 | 54 | 55 | 51 | 45 | 34 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 02:10:00 | 07/02/2023 | 02:15:00 | 63.2 | 67 | 63 | 53 | 56 | 57 | 57 | 54 | 47 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 02:15:00 | 07/02/2023 | 02:20:00 | 52.9 | 61 | 57 | 51 | 49 | 48 | 44 | 34 | 21 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 02:20:00 | 07/02/2023 | 02:25:00 | 52.7 | 61 | 59 | 51 | 49 | 48 | 43 | 34 | 21 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 02:25:00 | 07/02/2023 | 02:30:00 | 62.8 | 69 | 59 | 56 | 61 | 57 | 54 | 48 | 37 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |
| #### | 02:30:00 | 07/02/2023 | 02:35:00 | 64.4 | 75 | 59 | 58 | 62 | 58 | 56 | 50 | 40 |
| #### | 0        |            |          |      |    |    |    |    |    |    |    |    |



|      |          |            |          |      |    |    |    |    |    |    |    |    |
|------|----------|------------|----------|------|----|----|----|----|----|----|----|----|
| #### | 02:35:00 | 07/02/2023 | 02:40:00 | 53.8 | 56 | 52 | 49 | 50 | 49 | 43 | 32 | 21 |
| #### | 02:40:00 | 07/02/2023 | 02:45:00 | 47.7 | 54 | 51 | 47 | 44 | 43 | 37 | 25 | 16 |
| #### | 02:45:00 | 07/02/2023 | 02:50:00 | 50.4 | 58 | 54 | 50 | 48 | 45 | 40 | 32 | 20 |
| #### | 02:50:00 | 07/02/2023 | 02:55:00 | 62   | 70 | 58 | 53 | 55 | 57 | 56 | 51 | 42 |
| #### | 02:55:00 | 07/02/2023 | 03:00:00 | 52.1 | 59 | 56 | 50 | 49 | 47 | 42 | 33 | 23 |
| #### | 03:00:00 | 07/02/2023 | 03:05:00 | 49.5 | 57 | 54 | 48 | 47 | 45 | 39 | 30 | 19 |
| #### | 03:05:00 | 07/02/2023 | 03:10:00 | 56.6 | 68 | 57 | 51 | 51 | 51 | 49 | 47 | 39 |
| #### | 03:10:00 | 07/02/2023 | 03:15:00 | 61.6 | 70 | 58 | 53 | 55 | 56 | 55 | 51 | 42 |
| #### | 03:15:00 | 07/02/2023 | 03:20:00 | 51.5 | 59 | 56 | 50 | 48 | 47 | 42 | 32 | 20 |
| #### | 03:20:00 | 07/02/2023 | 03:25:00 | 56.3 | 62 | 56 | 52 | 53 | 52 | 48 | 38 | 24 |
| #### | 03:25:00 | 07/02/2023 | 03:30:00 | 64.1 | 74 | 59 | 58 | 62 | 58 | 55 | 48 | 35 |
| #### | 03:30:00 | 07/02/2023 | 03:35:00 | 50.1 | 57 | 55 | 48 | 47 | 45 | 41 | 32 | 20 |
| #### | 03:35:00 | 07/02/2023 | 03:40:00 | 49.6 | 56 | 54 | 48 | 47 | 44 | 40 | 31 | 20 |
| #### | 03:40:00 | 07/02/2023 | 03:45:00 | 60   | 66 | 62 | 53 | 55 | 55 | 54 | 48 | 38 |
| #### | 03:45:00 | 07/02/2023 | 03:50:00 | 53   | 59 | 56 | 51 | 50 | 49 | 44 | 34 | 22 |
| #### | 03:50:00 | 07/02/2023 | 03:55:00 | 59.3 | 66 | 63 | 52 | 55 | 54 | 53 | 47 | 36 |
| #### | 03:55:00 | 07/02/2023 | 04:00:00 | 56.1 | 58 | 57 | 53 | 52 | 50 | 48 | 43 | 31 |
| #### | 04:00:00 | 07/02/2023 | 04:05:00 | 46.2 | 54 | 51 | 47 | 43 | 40 | 34 | 24 | 17 |
| #### | 04:05:00 | 07/02/2023 | 04:10:00 | 46.2 | 54 | 50 | 47 | 43 | 40 | 35 | 27 | 18 |
| #### | 04:10:00 | 07/02/2023 | 04:15:00 | 45.7 | 55 | 51 | 46 | 42 | 40 | 33 | 22 | 16 |
| #### | 04:15:00 | 07/02/2023 | 04:20:00 | 45.6 | 55 | 51 | 46 | 43 | 39 | 32 | 22 | 16 |
| #### | 04:20:00 | 07/02/2023 | 04:25:00 | 45.9 | 54 | 51 | 46 | 43 | 40 | 34 | 23 | 16 |
| #### | 04:25:00 | 07/02/2023 | 04:30:00 | 46.2 | 54 | 51 | 47 | 43 | 41 | 34 | 23 | 16 |
| #### | 04:30:00 | 07/02/2023 | 04:35:00 | 44.6 | 53 | 50 | 46 | 42 | 38 | 32 | 21 | 16 |
| #### | 04:35:00 | 07/02/2023 | 04:40:00 | 45.1 | 54 | 51 | 45 | 42 | 40 | 33 | 22 | 16 |
| #### | 04:40:00 | 07/02/2023 | 04:45:00 | 45.3 | 54 | 51 | 46 | 43 | 40 | 33 | 23 | 16 |
| #### | 04:45:00 | 07/02/2023 | 04:50:00 | 46.7 | 55 | 52 | 47 | 43 | 41 | 35 | 24 | 17 |
| #### | 04:50:00 | 07/02/2023 | 04:55:00 | 46.2 | 54 | 51 | 47 | 43 | 40 | 34 | 25 | 17 |
| #### | 04:55:00 | 07/02/2023 | 05:00:00 | 45.6 | 55 | 51 | 46 | 43 | 40 | 33 | 23 | 16 |
| #### | 05:00:00 | 07/02/2023 | 05:05:00 | 46.4 | 54 | 51 | 46 | 43 | 41 | 34 | 24 | 17 |
| #### | 05:05:00 | 07/02/2023 | 05:10:00 | 47.5 | 55 | 52 | 46 | 45 | 42 | 36 | 24 | 17 |



|      |          |            |          |      |    |    |    |    |    |    |    |    |
|------|----------|------------|----------|------|----|----|----|----|----|----|----|----|
| #### | 05:10:00 | 07/02/2023 | 05:15:00 | 48.1 | 58 | 52 | 47 | 45 | 42 | 39 | 27 | 17 |
| #### | 05:15:00 | 07/02/2023 | 05:20:00 | 47.1 | 56 | 52 | 47 | 44 | 41 | 35 | 24 | 16 |
| #### | 05:20:00 | 07/02/2023 | 05:25:00 | 47.5 | 57 | 52 | 48 | 44 | 42 | 36 | 26 | 17 |
| #### | 05:25:00 | 07/02/2023 | 05:30:00 | 46.8 | 57 | 52 | 47 | 44 | 42 | 35 | 25 | 17 |
| #### | 05:30:00 | 07/02/2023 | 05:35:00 | 47.3 | 56 | 53 | 47 | 44 | 42 | 35 | 24 | 17 |
| #### | 05:35:00 | 07/02/2023 | 05:40:00 | 49.3 | 57 | 54 | 49 | 45 | 44 | 39 | 28 | 18 |
| #### | 05:40:00 | 07/02/2023 | 05:45:00 | 47.8 | 57 | 52 | 47 | 45 | 43 | 37 | 27 | 18 |
| #### | 05:45:00 | 07/02/2023 | 05:50:00 | 49.3 | 57 | 53 | 49 | 46 | 44 | 38 | 28 | 18 |
| #### | 05:50:00 | 07/02/2023 | 05:55:00 | 48.6 | 58 | 53 | 48 | 45 | 43 | 38 | 27 | 17 |
| #### | 05:55:00 | 07/02/2023 | 06:00:00 | 48.9 | 58 | 53 | 49 | 46 | 44 | 38 | 27 | 18 |
| #### | 06:00:00 | 07/02/2023 | 06:05:00 | 54   | 59 | 54 | 51 | 48 | 49 | 44 | 36 | 20 |
| #### | 06:05:00 | 07/02/2023 | 06:10:00 | 51.3 | 59 | 55 | 50 | 47 | 46 | 42 | 31 | 20 |
| #### | 06:10:00 | 07/02/2023 | 06:15:00 | 53.7 | 64 | 56 | 54 | 50 | 48 | 45 | 37 | 24 |
| #### | 06:15:00 | 07/02/2023 | 06:20:00 | 51.6 | 60 | 56 | 52 | 47 | 46 | 41 | 31 | 21 |
| #### | 06:20:00 | 07/02/2023 | 06:25:00 | 54.7 | 60 | 55 | 51 | 50 | 50 | 47 | 36 | 22 |
| #### | 06:25:00 | 07/02/2023 | 06:30:00 | 50.1 | 59 | 54 | 50 | 47 | 45 | 40 | 30 | 20 |
| #### | 06:30:00 | 07/02/2023 | 06:35:00 | 53.7 | 60 | 56 | 52 | 51 | 49 | 43 | 34 | 22 |
| #### | 06:35:00 | 07/02/2023 | 06:40:00 | 54.4 | 62 | 56 | 53 | 50 | 49 | 45 | 35 | 24 |
| #### | 06:40:00 | 07/02/2023 | 06:45:00 | 52.5 | 60 | 55 | 51 | 49 | 48 | 42 | 33 | 22 |
| #### | 06:45:00 | 07/02/2023 | 06:50:00 | 54   | 63 | 57 | 52 | 50 | 49 | 44 | 36 | 24 |
| #### | 06:50:00 | 07/02/2023 | 06:55:00 | 54.2 | 64 | 56 | 53 | 51 | 49 | 46 | 36 | 25 |
| #### | 06:55:00 | 07/02/2023 | 07:00:00 | 54.5 | 61 | 56 | 52 | 51 | 50 | 45 | 37 | 25 |

Table 14. Position 2 – Raw L90 Data

| STAR<br>T                |                | STOP                     |                | LAF9<br>0.0% | LZF9<br>0.0% | LZF9<br>0.0% | LZF9<br>0.0% | LZF9<br>0.0% | LZF9<br>0.0% | LZF9<br>0.0% | LZF9<br>0.0% | LZF9<br>0.0% |
|--------------------------|----------------|--------------------------|----------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| DATE                     | TIME           | DATE                     | TIME           |              | 63           | 125          | 250          | 500          | 1000         | 2000         | 4000         | 8000         |
| [YYY<br>Y-<br>MM-<br>DD] | [HH:M<br>M:SS] | [YYY<br>Y-<br>MM-<br>DD] | [HH:M<br>M:SS] | [DB]         | [DB]         | [DB]         | [DB]         | [DB]         | [DB]         | [DB]         | [DB]         | [DB]         |
| 06/02/<br>2023           | 11:07:<br>20   | 06/02/<br>2023           | 11:10:<br>00   | 55           | 61           | 55           | 54           | 52           | 50           | 46           | 37           | 25           |
| 06/02/<br>2023           | 11:10:<br>00   | 06/02/<br>2023           | 11:15:<br>00   | 54.8         | 62           | 55           | 54           | 52           | 50           | 46           | 36           | 23           |
| 06/02/<br>2023           | 11:15:<br>00   | 06/02/<br>2023           | 11:20:<br>00   | 55           | 61           | 55           | 53           | 52           | 50           | 46           | 37           | 24           |
| 06/02/<br>2023           | 11:20:<br>00   | 06/02/<br>2023           | 11:25:<br>00   | 57.4         | 62           | 56           | 55           | 53           | 52           | 49           | 41           | 27           |



|            |          |            |          |      |    |    |    |    |    |    |    |    |
|------------|----------|------------|----------|------|----|----|----|----|----|----|----|----|
| 06/02/2023 | 11:25:00 | 06/02/2023 | 11:30:00 | 57.5 | 63 | 56 | 55 | 54 | 52 | 49 | 39 | 27 |
| 06/02/2023 | 11:30:00 | 06/02/2023 | 11:35:00 | 53.9 | 61 | 55 | 53 | 51 | 49 | 44 | 34 | 22 |
| 06/02/2023 | 11:35:00 | 06/02/2023 | 11:40:00 | 59.3 | 64 | 58 | 56 | 54 | 54 | 52 | 45 | 31 |
| 06/02/2023 | 11:40:00 | 06/02/2023 | 11:45:00 | 55.7 | 62 | 56 | 54 | 53 | 50 | 47 | 37 | 26 |
| 06/02/2023 | 11:45:00 | 06/02/2023 | 11:50:00 | 54.4 | 61 | 55 | 53 | 51 | 49 | 46 | 36 | 24 |
| 06/02/2023 | 11:50:00 | 06/02/2023 | 11:55:00 | 54.4 | 61 | 55 | 53 | 51 | 49 | 45 | 35 | 24 |
| 06/02/2023 | 11:55:00 | 06/02/2023 | 12:00:00 | 55.1 | 61 | 55 | 53 | 52 | 50 | 46 | 36 | 24 |
| 06/02/2023 | 12:00:00 | 06/02/2023 | 12:05:00 | 56.4 | 62 | 55 | 55 | 53 | 51 | 47 | 40 | 28 |
| 06/02/2023 | 12:05:00 | 06/02/2023 | 12:10:00 | 56.4 | 63 | 56 | 55 | 53 | 51 | 48 | 38 | 26 |
| 06/02/2023 | 12:10:00 | 06/02/2023 | 12:15:00 | 58.4 | 63 | 57 | 56 | 55 | 53 | 50 | 40 | 28 |
| 06/02/2023 | 12:15:00 | 06/02/2023 | 12:20:00 | 54.3 | 60 | 55 | 53 | 51 | 49 | 44 | 36 | 24 |
| 06/02/2023 | 12:20:00 | 06/02/2023 | 12:25:00 | 57   | 63 | 56 | 55 | 53 | 52 | 48 | 40 | 28 |
| 06/02/2023 | 12:25:00 | 06/02/2023 | 12:30:00 | 55.2 | 62 | 55 | 54 | 52 | 50 | 46 | 37 | 24 |
| 06/02/2023 | 12:30:00 | 06/02/2023 | 12:35:00 | 54.4 | 60 | 55 | 53 | 51 | 49 | 45 | 36 | 24 |
| 06/02/2023 | 12:35:00 | 06/02/2023 | 12:40:00 | 54.7 | 61 | 55 | 53 | 52 | 49 | 45 | 36 | 24 |
| 06/02/2023 | 12:40:00 | 06/02/2023 | 12:45:00 | 55.3 | 61 | 55 | 54 | 52 | 50 | 46 | 37 | 25 |
| 06/02/2023 | 12:45:00 | 06/02/2023 | 12:50:00 | 54.8 | 61 | 55 | 54 | 52 | 49 | 45 | 36 | 24 |
| 06/02/2023 | 12:50:00 | 06/02/2023 | 12:55:00 | 57   | 63 | 57 | 55 | 53 | 51 | 49 | 38 | 26 |
| 06/02/2023 | 12:55:00 | 06/02/2023 | 13:00:00 | 54.9 | 61 | 55 | 54 | 52 | 49 | 45 | 35 | 24 |
| 06/02/2023 | 13:00:00 | 06/02/2023 | 13:05:00 | 54.6 | 60 | 55 | 54 | 53 | 49 | 45 | 35 | 24 |
| 06/02/2023 | 13:05:00 | 06/02/2023 | 13:10:00 | 56.3 | 62 | 56 | 54 | 53 | 51 | 47 | 39 | 27 |
| 06/02/2023 | 13:10:00 | 06/02/2023 | 13:15:00 | 55.2 | 61 | 55 | 54 | 53 | 50 | 46 | 36 | 24 |
| 06/02/2023 | 13:15:00 | 06/02/2023 | 13:20:00 | 57.5 | 61 | 55 | 55 | 54 | 51 | 49 | 42 | 32 |
| 06/02/2023 | 13:20:00 | 06/02/2023 | 13:25:00 | 56   | 61 | 55 | 54 | 53 | 51 | 47 | 38 | 25 |
| 06/02/2023 | 13:25:00 | 06/02/2023 | 13:30:00 | 59.2 | 62 | 56 | 56 | 55 | 55 | 51 | 44 | 30 |
| 06/02/2023 | 13:30:00 | 06/02/2023 | 13:35:00 | 58   | 61 | 56 | 55 | 54 | 54 | 49 | 41 | 26 |
| 06/02/2023 | 13:35:00 | 06/02/2023 | 13:40:00 | 55.5 | 61 | 55 | 54 | 52 | 51 | 47 | 38 | 25 |
| 06/02/2023 | 13:40:00 | 06/02/2023 | 13:45:00 | 56.1 | 61 | 55 | 54 | 53 | 51 | 47 | 38 | 25 |
| 06/02/2023 | 13:45:00 | 06/02/2023 | 13:50:00 | 56.3 | 61 | 55 | 54 | 53 | 51 | 48 | 38 | 26 |
| 06/02/2023 | 13:50:00 | 06/02/2023 | 13:55:00 | 55.4 | 61 | 55 | 54 | 53 | 50 | 46 | 36 | 24 |
| 06/02/2023 | 13:55:00 | 06/02/2023 | 14:00:00 | 56.2 | 61 | 55 | 55 | 53 | 51 | 47 | 38 | 25 |



|            |          |            |          |      |    |    |    |    |    |    |    |    |
|------------|----------|------------|----------|------|----|----|----|----|----|----|----|----|
| 06/02/2023 | 14:00:00 | 06/02/2023 | 14:05:00 | 56   | 61 | 56 | 55 | 54 | 50 | 46 | 38 | 25 |
| 06/02/2023 | 14:05:00 | 06/02/2023 | 14:10:00 | 55.3 | 61 | 55 | 54 | 53 | 50 | 46 | 37 | 25 |
| 06/02/2023 | 14:10:00 | 06/02/2023 | 14:15:00 | 58.5 | 63 | 56 | 55 | 55 | 53 | 50 | 42 | 29 |
| 06/02/2023 | 14:15:00 | 06/02/2023 | 14:20:00 | 54.2 | 61 | 55 | 53 | 52 | 49 | 45 | 36 | 24 |
| 06/02/2023 | 14:20:00 | 06/02/2023 | 14:25:00 | 54.8 | 60 | 55 | 54 | 52 | 50 | 45 | 36 | 25 |
| 06/02/2023 | 14:25:00 | 06/02/2023 | 14:30:00 | 54.7 | 60 | 55 | 54 | 52 | 50 | 46 | 36 | 24 |
| 06/02/2023 | 14:30:00 | 06/02/2023 | 14:35:00 | 54.6 | 60 | 55 | 53 | 52 | 50 | 45 | 36 | 24 |
| 06/02/2023 | 14:35:00 | 06/02/2023 | 14:40:00 | 58.7 | 65 | 57 | 55 | 54 | 53 | 51 | 42 | 30 |
| 06/02/2023 | 14:40:00 | 06/02/2023 | 14:45:00 | 56   | 61 | 55 | 55 | 53 | 51 | 47 | 38 | 27 |
| 06/02/2023 | 14:45:00 | 06/02/2023 | 14:50:00 | 56.2 | 61 | 56 | 54 | 54 | 51 | 47 | 38 | 26 |
| 06/02/2023 | 14:50:00 | 06/02/2023 | 14:55:00 | 56.5 | 62 | 56 | 55 | 53 | 51 | 48 | 38 | 25 |
| 06/02/2023 | 14:55:00 | 06/02/2023 | 15:00:00 | 56.4 | 61 | 56 | 55 | 54 | 51 | 48 | 38 | 27 |
| 06/02/2023 | 15:00:00 | 06/02/2023 | 15:05:00 | 56.3 | 61 | 56 | 55 | 53 | 51 | 47 | 39 | 27 |
| 06/02/2023 | 15:05:00 | 06/02/2023 | 15:10:00 | 55.3 | 61 | 56 | 54 | 53 | 50 | 46 | 37 | 26 |
| 06/02/2023 | 15:10:00 | 06/02/2023 | 15:15:00 | 56.4 | 60 | 55 | 54 | 53 | 51 | 48 | 38 | 26 |
| 06/02/2023 | 15:15:00 | 06/02/2023 | 15:20:00 | 56.8 | 62 | 56 | 54 | 54 | 52 | 48 | 39 | 27 |
| 06/02/2023 | 15:20:00 | 06/02/2023 | 15:25:00 | 55.4 | 61 | 55 | 54 | 52 | 50 | 46 | 38 | 26 |
| 06/02/2023 | 15:25:00 | 06/02/2023 | 15:30:00 | 54.4 | 61 | 55 | 53 | 52 | 49 | 45 | 37 | 25 |
| 06/02/2023 | 15:30:00 | 06/02/2023 | 15:35:00 | 56.6 | 61 | 56 | 54 | 53 | 51 | 48 | 39 | 26 |
| 06/02/2023 | 15:35:00 | 06/02/2023 | 15:40:00 | 62.2 | 63 | 57 | 56 | 58 | 58 | 54 | 44 | 31 |
| 06/02/2023 | 15:40:00 | 06/02/2023 | 15:45:00 | 57.7 | 63 | 57 | 55 | 55 | 52 | 49 | 41 | 30 |
| 06/02/2023 | 15:45:00 | 06/02/2023 | 15:50:00 | 56.2 | 61 | 56 | 55 | 53 | 50 | 47 | 40 | 29 |
| 06/02/2023 | 15:50:00 | 06/02/2023 | 15:55:00 | 55   | 61 | 56 | 54 | 52 | 50 | 46 | 37 | 25 |
| 06/02/2023 | 15:55:00 | 06/02/2023 | 16:00:00 | 54.8 | 60 | 55 | 54 | 52 | 50 | 45 | 37 | 25 |
| 06/02/2023 | 16:00:00 | 06/02/2023 | 16:05:00 | 55.5 | 61 | 56 | 54 | 52 | 50 | 47 | 37 | 26 |
| 06/02/2023 | 16:05:00 | 06/02/2023 | 16:10:00 | 56.1 | 61 | 56 | 54 | 53 | 51 | 47 | 38 | 26 |
| 06/02/2023 | 16:10:00 | 06/02/2023 | 16:15:00 | 58.4 | 65 | 58 | 55 | 54 | 53 | 51 | 44 | 32 |
| 06/02/2023 | 16:15:00 | 06/02/2023 | 16:20:00 | 54.6 | 60 | 55 | 54 | 52 | 49 | 45 | 36 | 25 |
| 06/02/2023 | 16:20:00 | 06/02/2023 | 16:25:00 | 55   | 61 | 55 | 54 | 52 | 50 | 46 | 36 | 25 |
| 06/02/2023 | 16:25:00 | 06/02/2023 | 16:30:00 | 56.6 | 61 | 56 | 55 | 54 | 51 | 48 | 38 | 26 |
| 06/02/2023 | 16:30:00 | 06/02/2023 | 16:35:00 | 55.4 | 61 | 56 | 54 | 53 | 50 | 46 | 37 | 26 |



|            |          |            |          |      |    |    |    |    |    |    |    |    |
|------------|----------|------------|----------|------|----|----|----|----|----|----|----|----|
| 06/02/2023 | 16:35:00 | 06/02/2023 | 16:40:00 | 54.8 | 61 | 55 | 53 | 52 | 50 | 45 | 36 | 25 |
| 06/02/2023 | 16:40:00 | 06/02/2023 | 16:45:00 | 57.5 | 62 | 56 | 56 | 54 | 52 | 49 | 40 | 28 |
| 06/02/2023 | 16:45:00 | 06/02/2023 | 16:50:00 | 56   | 60 | 55 | 54 | 53 | 51 | 47 | 38 | 27 |
| 06/02/2023 | 16:50:00 | 06/02/2023 | 16:55:00 | 56.3 | 62 | 57 | 55 | 53 | 51 | 47 | 38 | 29 |
| 06/02/2023 | 16:55:00 | 06/02/2023 | 17:00:00 | 55.5 | 60 | 56 | 54 | 52 | 50 | 46 | 37 | 27 |
| 06/02/2023 | 17:00:00 | 06/02/2023 | 17:05:00 | 55.3 | 59 | 55 | 53 | 52 | 50 | 46 | 37 | 26 |
| 06/02/2023 | 17:05:00 | 06/02/2023 | 17:10:00 | 59.1 | 63 | 57 | 56 | 55 | 53 | 51 | 43 | 32 |
| 06/02/2023 | 17:10:00 | 06/02/2023 | 17:15:00 | 61.1 | 65 | 58 | 56 | 56 | 55 | 55 | 49 | 34 |
| 06/02/2023 | 17:15:00 | 06/02/2023 | 17:20:00 | 55.3 | 60 | 55 | 54 | 52 | 50 | 46 | 37 | 25 |
| 06/02/2023 | 17:20:00 | 06/02/2023 | 17:25:00 | 56.3 | 60 | 55 | 54 | 54 | 51 | 47 | 38 | 26 |
| 06/02/2023 | 17:25:00 | 06/02/2023 | 17:30:00 | 56.6 | 62 | 56 | 55 | 54 | 51 | 47 | 38 | 27 |
| 06/02/2023 | 17:30:00 | 06/02/2023 | 17:35:00 | 55.8 | 61 | 56 | 54 | 53 | 51 | 46 | 38 | 27 |
| 06/02/2023 | 17:35:00 | 06/02/2023 | 17:40:00 | 59.8 | 66 | 59 | 57 | 55 | 55 | 51 | 45 | 35 |
| 06/02/2023 | 17:40:00 | 06/02/2023 | 17:45:00 | 60   | 67 | 59 | 57 | 55 | 55 | 51 | 45 | 35 |
| 06/02/2023 | 17:45:00 | 06/02/2023 | 17:50:00 | 62.2 | 66 | 60 | 59 | 59 | 58 | 53 | 47 | 37 |
| 06/02/2023 | 17:50:00 | 06/02/2023 | 17:55:00 | 60.6 | 64 | 58 | 58 | 57 | 56 | 51 | 44 | 32 |
| 06/02/2023 | 17:55:00 | 06/02/2023 | 18:00:00 | 57.8 | 63 | 57 | 55 | 53 | 53 | 48 | 40 | 28 |
| 06/02/2023 | 18:00:00 | 06/02/2023 | 18:05:00 | 55.6 | 61 | 55 | 54 | 53 | 50 | 46 | 37 | 26 |
| 06/02/2023 | 18:05:00 | 06/02/2023 | 18:10:00 | 59.9 | 64 | 57 | 57 | 56 | 55 | 52 | 43 | 31 |
| 06/02/2023 | 18:10:00 | 06/02/2023 | 18:15:00 | 59.6 | 68 | 58 | 57 | 55 | 55 | 51 | 45 | 35 |
| 06/02/2023 | 18:15:00 | 06/02/2023 | 18:20:00 | 59   | 63 | 57 | 56 | 54 | 53 | 52 | 44 | 30 |
| 06/02/2023 | 18:20:00 | 06/02/2023 | 18:25:00 | 56.4 | 61 | 56 | 55 | 54 | 51 | 48 | 38 | 27 |
| 06/02/2023 | 18:25:00 | 06/02/2023 | 18:30:00 | 58   | 63 | 57 | 56 | 55 | 53 | 49 | 39 | 26 |
| 06/02/2023 | 18:30:00 | 06/02/2023 | 18:35:00 | 55.5 | 61 | 56 | 55 | 53 | 50 | 46 | 38 | 26 |
| 06/02/2023 | 18:35:00 | 06/02/2023 | 18:40:00 | 54.9 | 61 | 55 | 54 | 53 | 49 | 45 | 35 | 23 |
| 06/02/2023 | 18:40:00 | 06/02/2023 | 18:45:00 | 54.4 | 60 | 55 | 54 | 52 | 49 | 44 | 36 | 25 |
| 06/02/2023 | 18:45:00 | 06/02/2023 | 18:50:00 | 56.1 | 61 | 56 | 54 | 53 | 51 | 47 | 37 | 25 |
| 06/02/2023 | 18:50:00 | 06/02/2023 | 18:55:00 | 55.8 | 62 | 56 | 54 | 53 | 51 | 46 | 37 | 25 |
| 06/02/2023 | 18:55:00 | 06/02/2023 | 19:00:00 | 56.1 | 60 | 55 | 55 | 54 | 51 | 47 | 37 | 25 |
| 06/02/2023 | 19:00:00 | 06/02/2023 | 19:05:00 | 54.8 | 60 | 55 | 54 | 52 | 49 | 45 | 35 | 23 |
| 06/02/2023 | 19:05:00 | 06/02/2023 | 19:10:00 | 57.6 | 64 | 56 | 55 | 54 | 52 | 49 | 39 | 27 |

|            |          |            |          |      |    |    |    |    |    |    |    |    |
|------------|----------|------------|----------|------|----|----|----|----|----|----|----|----|
| 06/02/2023 | 19:10:00 | 06/02/2023 | 19:15:00 | 57.4 | 62 | 56 | 54 | 54 | 52 | 49 | 41 | 28 |
| 06/02/2023 | 19:15:00 | 06/02/2023 | 19:20:00 | 55.4 | 60 | 55 | 53 | 53 | 50 | 46 | 36 | 24 |
| 06/02/2023 | 19:20:00 | 06/02/2023 | 19:25:00 | 54.3 | 59 | 55 | 53 | 52 | 49 | 44 | 35 | 24 |
| 06/02/2023 | 19:25:00 | 06/02/2023 | 19:30:00 | 56.3 | 61 | 55 | 55 | 54 | 51 | 47 | 37 | 25 |
| 06/02/2023 | 19:30:00 | 06/02/2023 | 19:35:00 | 56.2 | 60 | 55 | 54 | 54 | 51 | 47 | 37 | 25 |
| 06/02/2023 | 19:35:00 | 06/02/2023 | 19:40:00 | 54.5 | 59 | 55 | 53 | 53 | 49 | 45 | 36 | 24 |
| 06/02/2023 | 19:40:00 | 06/02/2023 | 19:45:00 | 54.9 | 60 | 55 | 53 | 52 | 49 | 45 | 36 | 24 |
| 06/02/2023 | 19:45:00 | 06/02/2023 | 19:50:00 | 54.9 | 61 | 55 | 54 | 52 | 50 | 45 | 35 | 24 |
| 06/02/2023 | 19:50:00 | 06/02/2023 | 19:55:00 | 54.5 | 60 | 55 | 53 | 52 | 49 | 45 | 35 | 23 |
| 06/02/2023 | 19:55:00 | 06/02/2023 | 20:00:00 | 54.4 | 60 | 55 | 53 | 52 | 49 | 44 | 35 | 23 |
| 06/02/2023 | 20:00:00 | 06/02/2023 | 20:05:00 | 53.7 | 60 | 55 | 53 | 51 | 48 | 44 | 35 | 23 |
| 06/02/2023 | 20:05:00 | 06/02/2023 | 20:10:00 | 56.9 | 63 | 56 | 55 | 53 | 52 | 48 | 39 | 26 |
| 06/02/2023 | 20:10:00 | 06/02/2023 | 20:15:00 | 55.1 | 61 | 55 | 53 | 52 | 50 | 46 | 36 | 24 |
| 06/02/2023 | 20:15:00 | 06/02/2023 | 20:20:00 | 54.1 | 60 | 55 | 53 | 51 | 49 | 44 | 36 | 23 |
| 06/02/2023 | 20:20:00 | 06/02/2023 | 20:25:00 | 54.4 | 60 | 55 | 53 | 51 | 49 | 45 | 36 | 24 |
| 06/02/2023 | 20:25:00 | 06/02/2023 | 20:30:00 | 53.9 | 60 | 55 | 53 | 51 | 49 | 45 | 35 | 23 |
| 06/02/2023 | 20:30:00 | 06/02/2023 | 20:35:00 | 53.4 | 59 | 55 | 53 | 50 | 48 | 43 | 35 | 23 |
| 06/02/2023 | 20:35:00 | 06/02/2023 | 20:40:00 | 54.3 | 59 | 55 | 53 | 51 | 49 | 45 | 36 | 24 |
| 06/02/2023 | 20:40:00 | 06/02/2023 | 20:45:00 | 55.1 | 60 | 55 | 53 | 52 | 50 | 47 | 37 | 26 |
| 06/02/2023 | 20:45:00 | 06/02/2023 | 20:50:00 | 53   | 59 | 54 | 53 | 50 | 48 | 43 | 34 | 22 |
| 06/02/2023 | 20:50:00 | 06/02/2023 | 20:55:00 | 54.5 | 59 | 55 | 53 | 52 | 49 | 45 | 36 | 23 |
| 06/02/2023 | 20:55:00 | 06/02/2023 | 21:00:00 | 54   | 60 | 55 | 53 | 51 | 49 | 45 | 35 | 23 |
| 06/02/2023 | 21:00:00 | 06/02/2023 | 21:05:00 | 53.5 | 59 | 55 | 53 | 50 | 48 | 44 | 35 | 23 |
| 06/02/2023 | 21:05:00 | 06/02/2023 | 21:10:00 | 53.2 | 59 | 55 | 52 | 50 | 48 | 43 | 35 | 23 |
| 06/02/2023 | 21:10:00 | 06/02/2023 | 21:15:00 | 55.8 | 61 | 55 | 54 | 52 | 51 | 48 | 37 | 25 |
| 06/02/2023 | 21:15:00 | 06/02/2023 | 21:20:00 | 52.8 | 59 | 54 | 52 | 50 | 48 | 43 | 35 | 23 |
| 06/02/2023 | 21:20:00 | 06/02/2023 | 21:25:00 | 54.2 | 60 | 55 | 53 | 51 | 49 | 45 | 36 | 23 |
| 06/02/2023 | 21:25:00 | 06/02/2023 | 21:30:00 | 53.3 | 59 | 54 | 52 | 50 | 48 | 44 | 35 | 23 |
| 06/02/2023 | 21:30:00 | 06/02/2023 | 21:35:00 | 52.5 | 58 | 54 | 52 | 50 | 47 | 43 | 34 | 22 |
| 06/02/2023 | 21:35:00 | 06/02/2023 | 21:40:00 | 54.1 | 59 | 55 | 53 | 51 | 49 | 45 | 36 | 24 |
| 06/02/2023 | 21:40:00 | 06/02/2023 | 21:45:00 | 53   | 59 | 54 | 52 | 50 | 48 | 43 | 35 | 23 |



|            |          |            |          |      |    |    |    |    |    |    |    |    |
|------------|----------|------------|----------|------|----|----|----|----|----|----|----|----|
| 06/02/2023 | 21:45:00 | 06/02/2023 | 21:50:00 | 52.7 | 60 | 55 | 52 | 50 | 48 | 43 | 34 | 23 |
| 06/02/2023 | 21:50:00 | 06/02/2023 | 21:55:00 | 56   | 63 | 55 | 53 | 54 | 50 | 47 | 38 | 24 |
| 06/02/2023 | 21:55:00 | 06/02/2023 | 22:00:00 | 56   | 64 | 55 | 53 | 54 | 50 | 47 | 38 | 24 |
| 06/02/2023 | 22:00:00 | 06/02/2023 | 22:05:00 | 56.1 | 63 | 54 | 53 | 53 | 51 | 47 | 38 | 24 |
| 06/02/2023 | 22:05:00 | 06/02/2023 | 22:10:00 | 55.2 | 63 | 54 | 52 | 53 | 50 | 46 | 38 | 24 |
| 06/02/2023 | 22:10:00 | 06/02/2023 | 22:15:00 | 55.7 | 63 | 54 | 53 | 53 | 50 | 47 | 37 | 24 |
| 06/02/2023 | 22:15:00 | 06/02/2023 | 22:20:00 | 53.7 | 62 | 55 | 53 | 51 | 49 | 44 | 35 | 23 |
| 06/02/2023 | 22:20:00 | 06/02/2023 | 22:25:00 | 55   | 66 | 54 | 53 | 51 | 50 | 47 | 38 | 24 |
| 06/02/2023 | 22:25:00 | 06/02/2023 | 22:30:00 | 53.2 | 60 | 54 | 52 | 51 | 48 | 43 | 34 | 23 |
| 06/02/2023 | 22:30:00 | 06/02/2023 | 22:35:00 | 54.6 | 65 | 54 | 52 | 51 | 49 | 46 | 37 | 24 |
| 06/02/2023 | 22:35:00 | 06/02/2023 | 22:40:00 | 55.2 | 66 | 55 | 53 | 51 | 50 | 47 | 38 | 24 |
| 06/02/2023 | 22:40:00 | 06/02/2023 | 22:45:00 | 52.8 | 59 | 54 | 52 | 50 | 48 | 43 | 34 | 23 |
| 06/02/2023 | 22:45:00 | 06/02/2023 | 22:50:00 | 55.4 | 63 | 54 | 53 | 53 | 50 | 46 | 37 | 23 |
| 06/02/2023 | 22:50:00 | 06/02/2023 | 22:55:00 | 55   | 63 | 54 | 52 | 52 | 49 | 46 | 37 | 23 |
| 06/02/2023 | 22:55:00 | 06/02/2023 | 23:00:00 | 54   | 61 | 54 | 52 | 51 | 49 | 45 | 36 | 23 |
| 07/02/2023 | 07:00:00 | 07/02/2023 | 07:05:00 | 58.1 | 62 | 57 | 55 | 54 | 53 | 50 | 43 | 27 |
| 07/02/2023 | 07:05:00 | 07/02/2023 | 07:10:00 | 55.1 | 61 | 56 | 54 | 51 | 50 | 46 | 38 | 25 |
| 07/02/2023 | 07:10:00 | 07/02/2023 | 07:15:00 | 54.2 | 61 | 55 | 53 | 51 | 49 | 45 | 37 | 25 |
| 07/02/2023 | 07:15:00 | 07/02/2023 | 07:20:00 | 55   | 61 | 55 | 53 | 51 | 49 | 47 | 37 | 24 |
| 07/02/2023 | 07:20:00 | 07/02/2023 | 07:25:00 | 56.9 | 63 | 55 | 54 | 52 | 51 | 51 | 42 | 26 |
| 07/02/2023 | 07:25:00 | 07/02/2023 | 07:30:00 | 53.5 | 60 | 55 | 53 | 50 | 48 | 44 | 35 | 24 |
| 07/02/2023 | 07:30:00 | 07/02/2023 | 07:35:00 | 53.7 | 60 | 55 | 53 | 50 | 49 | 45 | 36 | 24 |
| 07/02/2023 | 07:35:00 | 07/02/2023 | 07:40:00 | 59.5 | 64 | 59 | 57 | 55 | 54 | 52 | 46 | 32 |
| 07/02/2023 | 07:40:00 | 07/02/2023 | 07:45:00 | 54.8 | 61 | 56 | 54 | 51 | 49 | 46 | 37 | 24 |
| 07/02/2023 | 07:45:00 | 07/02/2023 | 07:50:00 | 57.1 | 63 | 57 | 55 | 53 | 51 | 49 | 42 | 29 |
| 07/02/2023 | 07:50:00 | 07/02/2023 | 07:55:00 | 55.7 | 61 | 56 | 54 | 52 | 51 | 47 | 38 | 26 |
| 07/02/2023 | 07:55:00 | 07/02/2023 | 08:00:00 | 54.4 | 60 | 55 | 53 | 51 | 49 | 46 | 36 | 25 |
| 07/02/2023 | 08:00:00 | 07/02/2023 | 08:05:00 | 57.6 | 63 | 58 | 57 | 54 | 52 | 50 | 42 | 31 |
| 07/02/2023 | 08:05:00 | 07/02/2023 | 08:10:00 | 54.6 | 61 | 55 | 54 | 51 | 49 | 45 | 36 | 24 |
| 07/02/2023 | 08:10:00 | 07/02/2023 | 08:15:00 | 55.2 | 61 | 56 | 54 | 52 | 50 | 46 | 37 | 25 |
| 07/02/2023 | 08:15:00 | 07/02/2023 | 08:20:00 | 54.6 | 61 | 56 | 53 | 51 | 50 | 45 | 36 | 25 |



|            |          |            |          |      |    |    |    |    |    |    |    |    |
|------------|----------|------------|----------|------|----|----|----|----|----|----|----|----|
| 07/02/2023 | 08:20:00 | 07/02/2023 | 08:25:00 | 56.6 | 62 | 56 | 55 | 53 | 52 | 48 | 39 | 27 |
| 07/02/2023 | 08:25:00 | 07/02/2023 | 08:30:00 | 56.4 | 63 | 56 | 54 | 53 | 51 | 48 | 41 | 28 |
| 07/02/2023 | 08:30:00 | 07/02/2023 | 08:35:00 | 54.1 | 60 | 55 | 53 | 51 | 49 | 44 | 36 | 25 |
| 07/02/2023 | 08:35:00 | 07/02/2023 | 08:40:00 | 54.7 | 61 | 56 | 54 | 52 | 50 | 45 | 38 | 27 |
| 07/02/2023 | 08:40:00 | 07/02/2023 | 08:45:00 | 56.5 | 62 | 56 | 55 | 53 | 51 | 47 | 39 | 29 |
| 07/02/2023 | 08:45:00 | 07/02/2023 | 08:50:00 | 54.4 | 61 | 55 | 54 | 52 | 49 | 45 | 37 | 27 |
| 07/02/2023 | 08:50:00 | 07/02/2023 | 08:55:00 | 55.7 | 61 | 57 | 56 | 53 | 51 | 46 | 38 | 28 |
| 07/02/2023 | 08:55:00 | 07/02/2023 | 09:00:00 | 60.1 | 64 | 57 | 56 | 54 | 54 | 53 | 48 | 35 |
| 07/02/2023 | 09:00:00 | 07/02/2023 | 09:05:00 | 56.1 | 63 | 56 | 55 | 52 | 51 | 47 | 39 | 28 |
| 07/02/2023 | 09:05:00 | 07/02/2023 | 09:10:00 | 56.8 | 62 | 56 | 54 | 53 | 52 | 49 | 40 | 28 |
| 07/02/2023 | 09:10:00 | 07/02/2023 | 09:15:00 | 55.3 | 61 | 55 | 54 | 52 | 50 | 46 | 37 | 25 |
| 07/02/2023 | 09:15:00 | 07/02/2023 | 09:20:00 | 53.8 | 60 | 55 | 53 | 51 | 49 | 44 | 36 | 24 |
| 07/02/2023 | 09:20:00 | 07/02/2023 | 09:25:00 | 55.1 | 61 | 56 | 54 | 52 | 50 | 46 | 37 | 25 |
| 07/02/2023 | 09:25:00 | 07/02/2023 | 09:30:00 | 55.1 | 62 | 56 | 54 | 52 | 50 | 46 | 37 | 25 |
| 07/02/2023 | 09:30:00 | 07/02/2023 | 09:35:00 | 58.2 | 64 | 58 | 56 | 54 | 53 | 50 | 41 | 29 |
| 07/02/2023 | 09:35:00 | 07/02/2023 | 09:40:00 | 55.4 | 61 | 56 | 55 | 53 | 50 | 46 | 37 | 25 |
| 07/02/2023 | 09:40:00 | 07/02/2023 | 09:45:00 | 56.4 | 62 | 56 | 55 | 53 | 51 | 48 | 40 | 27 |
| 07/02/2023 | 09:45:00 | 07/02/2023 | 09:50:00 | 59.4 | 64 | 58 | 56 | 55 | 54 | 51 | 43 | 31 |
| 07/02/2023 | 09:50:00 | 07/02/2023 | 09:55:00 | 55.1 | 61 | 56 | 54 | 52 | 50 | 46 | 37 | 26 |
| 07/02/2023 | 09:55:00 | 07/02/2023 | 10:00:00 | 55   | 61 | 55 | 54 | 52 | 50 | 46 | 37 | 24 |
| 07/02/2023 | 10:00:00 | 07/02/2023 | 10:05:00 | 56.8 | 62 | 57 | 55 | 53 | 52 | 48 | 41 | 29 |
| 07/02/2023 | 10:05:00 | 07/02/2023 | 10:10:00 | 60.3 | 65 | 58 | 57 | 55 | 55 | 53 | 45 | 32 |
| 07/02/2023 | 10:10:00 | 07/02/2023 | 10:15:00 | 61.8 | 64 | 60 | 60 | 57 | 57 | 54 | 47 | 36 |
| 07/02/2023 | 10:15:00 | 07/02/2023 | 10:20:00 | 58.6 | 64 | 57 | 55 | 54 | 53 | 52 | 43 | 30 |
| 07/02/2023 | 10:20:00 | 07/02/2023 | 10:25:00 | 54.6 | 61 | 55 | 53 | 51 | 49 | 46 | 37 | 25 |
| 07/02/2023 | 10:25:00 | 07/02/2023 | 10:30:00 | 56.9 | 62 | 56 | 55 | 53 | 52 | 48 | 40 | 29 |
| 07/02/2023 | 10:30:00 | 07/02/2023 | 10:35:00 | 55   | 62 | 56 | 53 | 52 | 50 | 46 | 37 | 25 |
| 07/02/2023 | 10:35:00 | 07/02/2023 | 10:40:00 | 60   | 62 | 56 | 56 | 55 | 57 | 51 | 43 | 32 |
| 07/02/2023 | 10:40:00 | 07/02/2023 | 10:45:00 | 60.8 | 63 | 56 | 56 | 55 | 58 | 52 | 43 | 32 |
| 07/02/2023 | 10:45:00 | 07/02/2023 | 10:50:00 | 60.9 | 62 | 57 | 56 | 56 | 57 | 52 | 43 | 29 |
| 07/02/2023 | 10:50:00 | 07/02/2023 | 10:55:00 | 57.4 | 63 | 57 | 55 | 53 | 53 | 49 | 39 | 26 |



|            |          |            |          |      |    |    |    |    |    |    |    |    |
|------------|----------|------------|----------|------|----|----|----|----|----|----|----|----|
| 07/02/2023 | 10:55:00 | 07/02/2023 | 11:00:00 | 54.9 | 61 | 55 | 54 | 52 | 50 | 46 | 38 | 26 |
| 07/02/2023 | 11:00:00 | 07/02/2023 | 11:05:00 | 56   | 62 | 56 | 54 | 53 | 51 | 47 | 39 | 27 |
| 07/02/2023 | 11:05:00 | 07/02/2023 | 11:10:00 | 56.5 | 62 | 56 | 55 | 53 | 52 | 48 | 40 | 28 |
| 07/02/2023 | 11:10:00 | 07/02/2023 | 11:15:00 | 54.8 | 60 | 55 | 53 | 51 | 50 | 46 | 37 | 24 |
| 07/02/2023 | 11:15:00 | 07/02/2023 | 11:20:00 | 55.4 | 61 | 56 | 54 | 52 | 50 | 47 | 38 | 25 |
| 07/02/2023 | 11:20:00 | 07/02/2023 | 11:25:00 | 58.8 | 62 | 57 | 56 | 54 | 53 | 51 | 41 | 29 |
| 07/02/2023 | 11:25:00 | 07/02/2023 | 11:30:00 | 56.9 | 61 | 57 | 55 | 53 | 52 | 48 | 40 | 27 |
| 07/02/2023 | 11:30:00 | 07/02/2023 | 11:35:00 | 54.9 | 61 | 56 | 54 | 52 | 50 | 46 | 37 | 25 |
| 07/02/2023 | 11:35:00 | 07/02/2023 | 11:40:00 | 55.5 | 62 | 56 | 54 | 52 | 50 | 46 | 37 | 25 |
| 07/02/2023 | 11:40:00 | 07/02/2023 | 11:45:00 | 54.6 | 61 | 56 | 54 | 52 | 50 | 45 | 36 | 24 |
| 07/02/2023 | 11:45:00 | 07/02/2023 | 11:50:00 | 56.4 | 60 | 56 | 55 | 54 | 51 | 47 | 39 | 28 |
| 07/02/2023 | 11:50:00 | 07/02/2023 | 11:55:00 | 55.2 | 60 | 56 | 54 | 52 | 50 | 46 | 37 | 25 |
| 07/02/2023 | 11:55:00 | 07/02/2023 | 12:00:00 | 55   | 60 | 56 | 54 | 52 | 50 | 46 | 37 | 25 |
| 07/02/2023 | 12:00:00 | 07/02/2023 | 12:05:00 | 57.1 | 62 | 57 | 55 | 54 | 52 | 48 | 40 | 28 |
| 07/02/2023 | 12:05:00 | 07/02/2023 | 12:10:00 | 56.2 | 61 | 56 | 54 | 53 | 51 | 48 | 39 | 27 |
| 07/02/2023 | 12:10:00 | 07/02/2023 | 12:15:00 | 56.4 | 61 | 56 | 54 | 53 | 51 | 48 | 39 | 27 |
| 07/02/2023 | 12:15:00 | 07/02/2023 | 12:20:00 | 56.6 | 62 | 57 | 55 | 53 | 51 | 48 | 39 | 27 |
| 07/02/2023 | 12:20:00 | 07/02/2023 | 12:25:00 | 57.7 | 63 | 57 | 56 | 54 | 52 | 49 | 41 | 29 |
| 07/02/2023 | 12:25:00 | 07/02/2023 | 12:30:00 | 57.5 | 61 | 56 | 55 | 54 | 52 | 49 | 40 | 28 |
| 07/02/2023 | 12:30:00 | 07/02/2023 | 12:35:00 | 55.7 | 59 | 55 | 54 | 53 | 50 | 46 | 37 | 26 |
| 07/02/2023 | 12:35:00 | 07/02/2023 | 12:40:00 | 58.3 | 61 | 56 | 55 | 54 | 53 | 49 | 41 | 31 |
| 07/02/2023 | 12:40:00 | 07/02/2023 | 12:45:00 | 55.6 | 61 | 56 | 54 | 52 | 50 | 46 | 38 | 26 |
| 07/02/2023 | 12:45:00 | 07/02/2023 | 12:50:00 | 55.3 | 62 | 56 | 54 | 52 | 50 | 46 | 37 | 26 |
| 07/02/2023 | 12:50:00 | 07/02/2023 | 12:54:06 | 57   | 61 | 56 | 54 | 53 | 52 | 49 | 39 | 28 |
|            |          |            |          |      |    |    |    |    |    |    |    |    |
| 06/02/2023 | 23:00:00 | 06/02/2023 | 23:05:00 | 54   | 60 | 53 | 52 | 51 | 49 | 46 | 38 | 24 |
| 06/02/2023 | 23:05:00 | 06/02/2023 | 23:10:00 | 53.2 | 61 | 53 | 52 | 50 | 48 | 45 | 36 | 23 |
| 06/02/2023 | 23:10:00 | 06/02/2023 | 23:15:00 | 52.6 | 57 | 53 | 51 | 49 | 47 | 44 | 34 | 22 |
| 06/02/2023 | 23:15:00 | 06/02/2023 | 23:20:00 | 52   | 57 | 53 | 51 | 49 | 47 | 42 | 34 | 22 |
| 06/02/2023 | 23:20:00 | 06/02/2023 | 23:25:00 | 51.6 | 56 | 52 | 50 | 49 | 46 | 42 | 33 | 22 |
| 06/02/2023 | 23:25:00 | 06/02/2023 | 23:30:00 | 51.5 | 56 | 52 | 50 | 49 | 46 | 42 | 33 | 22 |



|            |          |            |          |      |    |    |    |    |    |    |    |    |
|------------|----------|------------|----------|------|----|----|----|----|----|----|----|----|
| 06/02/2023 | 23:30:00 | 06/02/2023 | 23:35:00 | 50.8 | 55 | 52 | 50 | 48 | 45 | 41 | 33 | 21 |
| 06/02/2023 | 23:35:00 | 06/02/2023 | 23:40:00 | 52.8 | 59 | 54 | 51 | 49 | 48 | 44 | 35 | 22 |
| 06/02/2023 | 23:40:00 | 06/02/2023 | 23:45:00 | 51.1 | 56 | 52 | 51 | 48 | 46 | 41 | 33 | 21 |
| 06/02/2023 | 23:45:00 | 06/02/2023 | 23:50:00 | 51.4 | 56 | 52 | 50 | 49 | 46 | 41 | 33 | 21 |
| 06/02/2023 | 23:50:00 | 06/02/2023 | 23:55:00 | 51.7 | 55 | 52 | 51 | 49 | 47 | 42 | 33 | 22 |
| 06/02/2023 | 23:55:00 | 07/02/2023 | 00:00:00 | 50.8 | 55 | 52 | 50 | 48 | 45 | 41 | 33 | 21 |
| 07/02/2023 | 00:00:00 | 07/02/2023 | 00:05:00 | 52.5 | 58 | 53 | 51 | 50 | 47 | 43 | 34 | 22 |
| 07/02/2023 | 00:05:00 | 07/02/2023 | 00:10:00 | 50.4 | 55 | 52 | 50 | 48 | 45 | 40 | 32 | 21 |
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| 07/02/2023 | 00:15:00 | 07/02/2023 | 00:20:00 | 50.7 | 55 | 51 | 50 | 48 | 46 | 41 | 33 | 21 |
| 07/02/2023 | 00:20:00 | 07/02/2023 | 00:25:00 | 50.9 | 55 | 52 | 50 | 48 | 46 | 41 | 33 | 21 |
| 07/02/2023 | 00:25:00 | 07/02/2023 | 00:30:00 | 50.2 | 54 | 52 | 50 | 47 | 45 | 40 | 32 | 21 |
| 07/02/2023 | 00:30:00 | 07/02/2023 | 00:35:00 | 50.5 | 55 | 51 | 50 | 48 | 45 | 41 | 32 | 21 |
| 07/02/2023 | 00:35:00 | 07/02/2023 | 00:40:00 | 50.5 | 55 | 52 | 49 | 48 | 45 | 41 | 33 | 21 |
| 07/02/2023 | 00:40:00 | 07/02/2023 | 00:45:00 | 50   | 54 | 52 | 49 | 47 | 45 | 40 | 32 | 21 |
| 07/02/2023 | 00:45:00 | 07/02/2023 | 00:50:00 | 49.8 | 54 | 51 | 49 | 47 | 45 | 40 | 32 | 21 |
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| 07/02/2023 | 01:10:00 | 07/02/2023 | 01:15:00 | 52.3 | 62 | 55 | 51 | 49 | 47 | 41 | 33 | 22 |
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| 07/02/2023 | 01:40:00 | 07/02/2023 | 01:45:00 | 50.1 | 55 | 52 | 49 | 47 | 45 | 40 | 32 | 21 |
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| 07/02/2023 | 01:50:00 | 07/02/2023 | 01:55:00 | 50.3 | 55 | 52 | 50 | 47 | 45 | 41 | 32 | 21 |
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| 07/02/2023 | 02:00:00 | 07/02/2023 | 02:05:00 | 53.3 | 56 | 53 | 51 | 49 | 48 | 46 | 40 | 27 |



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| 07/02/2023 | 02:05:00 | 07/02/2023 | 02:10:00 | 53.2 | 58 | 53 | 51 | 49 | 48 | 45 | 36 | 25 |
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| 07/02/2023 | 02:20:00 | 07/02/2023 | 02:25:00 | 54.7 | 62 | 55 | 53 | 52 | 49 | 45 | 37 | 23 |
| 07/02/2023 | 02:25:00 | 07/02/2023 | 02:30:00 | 54.1 | 59 | 54 | 52 | 51 | 48 | 45 | 36 | 23 |
| 07/02/2023 | 02:30:00 | 07/02/2023 | 02:35:00 | 54.5 | 62 | 55 | 53 | 52 | 49 | 45 | 37 | 23 |
| 07/02/2023 | 02:35:00 | 07/02/2023 | 02:40:00 | 51.8 | 54 | 52 | 50 | 50 | 47 | 42 | 33 | 22 |
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| 07/02/2023 | 02:45:00 | 07/02/2023 | 02:50:00 | 50.7 | 55 | 53 | 51 | 48 | 45 | 41 | 33 | 22 |
| 07/02/2023 | 02:50:00 | 07/02/2023 | 02:55:00 | 53   | 60 | 52 | 51 | 49 | 48 | 45 | 38 | 24 |
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| 07/02/2023 | 03:00:00 | 07/02/2023 | 03:05:00 | 50.4 | 55 | 52 | 50 | 47 | 45 | 41 | 33 | 21 |
| 07/02/2023 | 03:05:00 | 07/02/2023 | 03:10:00 | 52.2 | 60 | 52 | 51 | 49 | 47 | 44 | 36 | 23 |
| 07/02/2023 | 03:10:00 | 07/02/2023 | 03:15:00 | 52.4 | 58 | 52 | 50 | 48 | 47 | 43 | 34 | 22 |
| 07/02/2023 | 03:15:00 | 07/02/2023 | 03:20:00 | 50.8 | 55 | 52 | 50 | 48 | 45 | 41 | 33 | 21 |
| 07/02/2023 | 03:20:00 | 07/02/2023 | 03:25:00 | 54.7 | 61 | 55 | 53 | 52 | 49 | 45 | 37 | 23 |
| 07/02/2023 | 03:25:00 | 07/02/2023 | 03:30:00 | 51.6 | 58 | 54 | 52 | 49 | 46 | 42 | 33 | 22 |
| 07/02/2023 | 03:30:00 | 07/02/2023 | 03:35:00 | 50   | 55 | 52 | 50 | 47 | 45 | 40 | 33 | 21 |
| 07/02/2023 | 03:35:00 | 07/02/2023 | 03:40:00 | 50.3 | 55 | 52 | 50 | 47 | 45 | 41 | 33 | 21 |
| 07/02/2023 | 03:40:00 | 07/02/2023 | 03:45:00 | 52.6 | 56 | 52 | 50 | 49 | 48 | 45 | 37 | 23 |
| 07/02/2023 | 03:45:00 | 07/02/2023 | 03:50:00 | 50.7 | 56 | 52 | 50 | 48 | 46 | 41 | 33 | 21 |
| 07/02/2023 | 03:50:00 | 07/02/2023 | 03:55:00 | 52.5 | 57 | 52 | 50 | 49 | 47 | 44 | 37 | 23 |
| 07/02/2023 | 03:55:00 | 07/02/2023 | 04:00:00 | 51.8 | 54 | 52 | 52 | 49 | 46 | 42 | 35 | 23 |
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| 07/02/2023 | 04:25:00 | 07/02/2023 | 04:30:00 | 49.8 | 54 | 51 | 50 | 47 | 44 | 40 | 32 | 21 |
| 07/02/2023 | 04:30:00 | 07/02/2023 | 04:35:00 | 49.5 | 53 | 51 | 49 | 46 | 44 | 40 | 32 | 21 |
| 07/02/2023 | 04:35:00 | 07/02/2023 | 04:40:00 | 49.6 | 54 | 51 | 49 | 47 | 44 | 40 | 32 | 21 |



|            |          |            |          |      |    |    |    |    |    |    |    |    |
|------------|----------|------------|----------|------|----|----|----|----|----|----|----|----|
| 07/02/2023 | 04:40:00 | 07/02/2023 | 04:45:00 | 50   | 54 | 51 | 49 | 47 | 45 | 41 | 33 | 21 |
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| 07/02/2023 | 05:05:00 | 07/02/2023 | 05:10:00 | 50.8 | 56 | 52 | 50 | 48 | 46 | 41 | 33 | 21 |
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| 07/02/2023 | 05:30:00 | 07/02/2023 | 05:35:00 | 50.3 | 55 | 52 | 49 | 48 | 45 | 40 | 33 | 21 |
| 07/02/2023 | 05:35:00 | 07/02/2023 | 05:40:00 | 51.3 | 57 | 53 | 50 | 49 | 46 | 42 | 33 | 22 |
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| 07/02/2023 | 06:20:00 | 07/02/2023 | 06:25:00 | 53   | 60 | 55 | 52 | 50 | 48 | 44 | 35 | 23 |
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| 07/02/2023 | 06:45:00 | 07/02/2023 | 06:50:00 | 58.3 | 64 | 57 | 54 | 54 | 52 | 52 | 45 | 31 |
| 07/02/2023 | 06:50:00 | 07/02/2023 | 06:55:00 | 56.3 | 62 | 56 | 54 | 52 | 51 | 48 | 39 | 27 |
| 07/02/2023 | 06:55:00 | 07/02/2023 | 07:00:00 | 55.5 | 61 | 56 | 54 | 52 | 51 | 47 | 38 | 24 |

## **APPENDIX B – NOTES FOR QUALITY CONTROL**

### **1. Blockwork**

All blockwork is to be mortared to an almost fair faced standard both horizontally and vertically. Only perfect blocks may be used with no pitting or cracks. The blockwork must seal effectively to the underside of the soffit.

Where blockwork walls form a cavity wall, care should be taken to avoid rubble and snots from bridging the cavity. This is especially important where one or more of the leaves is floating.

### **2. Plasterboard**

All plasterboard joints are to be butted tight. The rule of thumb is that the joint should be tight enough over its entire length to prevent a normal business card from being inserted. Multiple layers should be fitted with staggered joints.

Base details and deflection heads are to be as per the British Gypsum White Book unless otherwise stated, and copious amounts of mastic to be used when fitting to the walls, floor and ceiling respectively.

### **3. Mineral Fibre**

Mineral fibre slabs are to be butted tightly together and to boundary structures, to form a homogeneous layer.

### **4. Windows**

All window frames are to be a good tight fit into the building structure with any gaps to be filled both internally and externally with a non-setting mastic in addition to the usual weather proofing seal to the exterior. Any gaps between the frame and building that are greater than 5 mm are to be packed with a dense mineral fibre prior to mastic sealing.

### **5. Electrical Sockets**

Electrical sockets must not be fitted back to back and removed areas of blockwork and plasterboard should be kept to an absolute minimum.

### **6. Water Pipes**

All water pipes (and any other pipework) are to be resiliently mounted to avoid "water hammer". This is particularly important for plasterboard walls.

### **7. Penetrations**

Penetrations are to be dealt with as described in this report. Details for specific services penetrations may be supplied upon request.

### **8. Approved Samples and Inspections**

Samples of each individual acoustic element should be provided for inspection at the beginning of its installation. Once approved, the Clerk of Works must ensure that the same level of quality continues throughout construction.

## APPENDIX C – DEFINITION OF ACOUSTIC TERMS

### The decibel

This is the basic unit of noise, denoted dB.

### A Weighting

This is a weighting process which simulates the human ear's different sensitivity at different frequencies. A weighting can be shown two typical ways, 50 dB(A)  $L_{eq}$  or 50 dB  $L_{Aeq}$ . Both mean the same thing. (See below for a definition of  $L_{eq}$ ). The dB(A) level can be regarded as the overall level perceived by human beings.

### $L_{eq}$ and $L_{eq(s)}$

This is the equivalent continuous noise level which contains the same acoustic energy as the actual time-varying sound. In other words it is a kind of average noise level. It is denoted dB  $L_{eq}$  or, for A-weighted figures dB(A)  $L_{eq}$  or dB  $L_{Aeq}$ . It can also be expressed in terms of frequency analysis (see later).  $L_{eq(s)}$  is the sample  $L_{eq}$  level.

### $L_n$

This is the level exceeded for n% of the time. It is denoted dB  $L_n$  or, for A-weighted figures dB(A)  $L_n$  or dB  $L_{An}$ . It can be expressed in terms of frequency analysis (see later).  $L_{90}$  is the level exceeded for 90% of the time and is a measure of the lowest level typically reached.  $L_{10}$  is the level exceeded for 10% of the time and is the highest level typically reached.  $L_{50}$  is the level exceeded for 50% of the time and, mathematically, it is the median.

### $L_{max}$

This is the maximum level reached during a measurement period. The "time constant", or the ability of the equipment to respond to impulses is usually expressed along with it, e.g. "Fast", "Slow", etc. It is denoted dB  $L_{max}$  or, for A-weighted figures dB(A)  $L_{max}$ , dB  $L_{Amax}$ , etc. It can also be expressed in terms of frequency analysis.

### Frequency Analysis

Whereas dB(A) gives a very useful overall figure, it has its limitations in that it cannot be used to model or predict the effect of noise control and mitigation as this nearly always has radically different performance at different frequencies.

Frequency analysis expresses an overall noise level at each frequency or band of frequencies in the audible range. Octave band analysis divides the audible range into 10 bands from 31.5 Hz to 16 kHz and the noise level in each band can be expressed in any form e.g.  $L_{eq}$ ,  $L_{90}$ ,  $L_{max}$  etc. One third octave band analysis uses 30 bands.

Narrow band analysis takes the process to resolutions of less than 1 Hz. This is useful for identifying the existence of tones (whines, hums, etc.) and in pin-pointing the sources.