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**BALDOCK STREET, ROYSTON**

**HERTFORDSHIRE**

**NOISE IMPACT ASSESSMENT**

Technical Report: R10145-1 Rev 0

Date: 26<sup>th</sup> July 2023

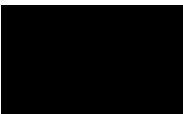
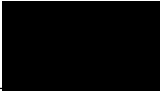
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## 24 Acoustics Document Control Sheet

**Project Title:** Baldock Street, Royston, Hertfordshire – Noise Impact Assessment

**Report Ref:** R10145-1 Rev 0

**Date:** 26<sup>th</sup> July 2023

|                                       | Name                             | Position                | Signature                                                                          | Date       |
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| For and on behalf of 24 Acoustics Ltd |                                  |                         |                                                                                    |            |

## Document Status and Approval Schedule

| Revision | Description        | Prepared By | Reviewed By     | Approved By     |
|----------|--------------------|-------------|-----------------|-----------------|
| 0        | Approved for issue | Andre Pires | Chris McConnell | Stephen Gosling |
|          |                    |             |                 |                 |
|          |                    |             |                 |                 |

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| CONTENTS                                        | PAGE |
|-------------------------------------------------|------|
| 1.0 Introduction                                | 4    |
| 2.0 Site Description                            | 4    |
| 3.0 Standards and Guidance                      | 5    |
| 4.0 Environmental Noise Surveys                 | 9    |
| 5.0 Existing Plant Noise                        | 11   |
| 6.0 Calculations and Noise Mitigation Strategy  | 13   |
| 7.0 Conclusions                                 | 15   |
| References                                      | 16   |
| Figures                                         | 17   |
| Appendix A – Acoustic Terminology               | 19   |
| Appendix B – Environmental Noise Survey Results | 20   |

## **1.0 INTRODUCTION**

- 1.1 24 Acoustics Ltd has been appointed by McCarthy Stone to provide a noise impact assessment for proposed retirement living apartments at Baldock Street, Royston, Hertfordshire.
- 1.2 The site is affected primarily by noise from road traffic using Baldock Street to the north of the site as well as noise from plant serving the Jolly Postie Public House to the east of the site. Accordingly, this noise impact assessment has included:
- Environmental noise monitoring;
  - Consideration of the ambient noise levels affecting the site;
  - Assessment of internal noise levels within the proposed dwellings.
- 1.3 This report presents the results of the assessment, following site visits and an environmental noise survey undertaken between 29<sup>th</sup> June to 6<sup>th</sup> July 2023.
- 1.4 All sound pressure levels quoted in this report are in dB relative to 20  $\mu$ Pa. A glossary of the acoustic terminology used in this report is provided in Appendix A.

## **2.0 SITE DESCRIPTION**

- 2.1 The site is currently a vacant building used previously as a supermarket. It is proposed to demolish the existing buildings and construct a new retirement living building. The site is bounded by Baldock Street to the north and Princes Mews and car park to the west. To the south of the site there is an access road and bounding the site to the east is the Jolly Postie Public House.
- 2.2 It is proposed to construct a three-storey block of retirement living apartments with associated ancillary spaces and a commercial unit on the ground floor. The primary source of noise in the area is road traffic on Baldock Street to the north. The site layout is shown in Figure 1, and the proposed site plan in Figure 2.
- 2.3 To the east, approximately 15m from the boundary is the Jolly Postie Public House which includes a small outside seating area and plant located on the roof.

### 3.0 STANDARDS AND GUIDANCE

#### National Planning Policy Framework and Noise Policy Statement for England

- 3.1 Paragraph 185 of the National Planning Policy Framework (NPPF) [Reference 1] states that planning policies and decisions should:
- a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;
  - b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.
- 3.2 The NPPF also refers to the Noise Policy Statement for England (NPSE) [Reference 2] which is intended to apply to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise. The NPSE sets out the Government's long-term vision to 'promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development' which is supported by the following aims.
- Avoid significant adverse impacts on health and quality of life;
  - Mitigate and minimise adverse impacts on health and quality of life.
- 3.3 The NPSE defines the concept of a 'significant observed adverse effect level' (SOAEL) as 'the level above which significant adverse effects on health and quality of life occur'. The following guidance is provided within the NPSE:

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

- 3.4 The National Planning Practice Guidance (NPPG) [Reference 3] is written to support the NPPF with more specific planning guidance. The NPPG reflects the NPSE and states that noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. It also states that opportunities should be taken, where practicable, to achieve improvements to the acoustic environment. The NPPG states that noise can over-ride other planning concerns but should not be considered in isolation from the other economic, social, and environmental dimensions of the proposed development.
- 3.5 The NPPG expands upon the concept of SOAEL (together with Lowest Observable Adverse Effect Level, LOAEL and No Observed Effect Level, NOEL) as introduced in the NPSE and provides a table of noise exposure hierarchy for use in noise impact assessments in the planning system.
- 3.6 The NPPG also expands on the 'agent of change' principle and provides guidance on how the risk of conflict between new development and existing businesses can be addressed, including where mitigation is required. It is relevant to note that the Agent of Change applies under the condition of a likely significant adverse impact.
- 3.7 The NPPF, NPSE and NPPG documents do not refer to specific noise criteria. For residential developments 24 Acoustics considers that the spirit of the requirements of the NPPF and NPSE will be complied with if criteria from British Standard 8233: 2014 and guidance from the World Health Organisation are adopted for internal noise levels within dwellings.

#### Professional Practice Guidance on Planning & Noise (ProPG)

- 3.8 The Professional Practice Guidance on Planning and Noise (ProPG) [Reference 4] was published jointly by the Association of Noise Consultants, Institute of Acoustics and Chartered Institute of Environmental Health in May 2017. The guidance relates to the consideration of existing sources of transportation noise upon proposed new residential development and strives to:
- Advocate full consideration of the acoustic environment from the earliest possible stage of the development control process;
  - Encourage the process of good acoustic design in and around new residential developments;
  - Outline what should be taken into account in deciding planning applications for new noise-sensitive developments;

- Improve understanding of how to determine the extent of potential noise impact and effect; and
  - Assist the delivery of sustainable development.
- 3.9 The guidance describes a recommended approach for new residential development, which includes four key elements of the assessment process, identified below:
- i. Good acoustic design process;
  - ii. Internal noise level guidelines;
  - iii. External amenity area noise assessment;
  - iv. Assessment of other relevant issues.
- 3.10 It is important to note that the guidance in ProPG does not constitute an official government code of practice and neither replaces nor provides an authoritative interpretation of the law or government policy.

#### BS 8233:2014 and WHO Guidelines

- 3.11 BS 8233:2014 [Reference 5] provides design guidance for dwelling houses, flats and rooms in residential use and recommends that internal noise levels in dwellings do not exceed 35 dB  $L_{Aeq,16hr}$  in living rooms and bedrooms during the day, 40 dB  $L_{Aeq,16hr}$  in dining rooms during the day and 30 dB  $L_{Aeq,8hr}$  in bedrooms at night.
- 3.12 BS 8233:2014 also notes that *“Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or  $L_{Amax,F}$ , depending on the character and number of events per night.”*
- 3.13 Although the guidelines have no formal standing, the World Health Organisation (WHO) provides guidance on desirable internal noise levels to minimise the risk of sleep disturbance. The WHO 2000 guidelines [Reference 6] suggest internal night-time noise levels not exceeding 30 dB  $L_{Aeq,8hr}$  or regularly (10 – 15 times per night) exceeding 45 dB  $L_{Amax,f}$  for ‘a good night’s sleep’.
- 3.14 BS 8233:2014 suggests aspirational limits for noise levels in external amenity spaces such as gardens and the standard recognises that the desirable noise levels for external amenity areas are not always achievable in certain locations.

BS 4142: 2014+A1:2019 Methods for Rating Industrial and Commercial Sound

- 3.15 BS 4142:2014 [Reference 7] provides a method for rating the effects of industrial and commercial sound on residential areas. The scope of the standard specifically excludes noise from road traffic.
- 3.16 The standard advocates a comparison between the representative measured  $L_{A90}$  background noise level and  $L_{Aeq}$  noise level from the source being considered. For rating purposes if the noise source is tonal, intermittent or otherwise distinctive in character, a rating correction should be applied.
- 3.17 BS 4142 states that certain acoustic features can increase the significance of impact of that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location a character correction should be applied to the specific sound level to determine the rating level. The rating correction is determined based upon the impulsivity and tonality of the sound noise level. The subjective method described in the standard describes the following rating corrections:
- |              |                                              |          |
|--------------|----------------------------------------------|----------|
| Tonality:    | Tone just perceptible at receptor:           | + 2 dBA; |
|              | Tone clearly perceptible at receptor:        | + 4 dBA; |
|              | Tone highly perceptible at receptor:         | + 6 dBA. |
| Impulsivity: | Impulsivity just perceptible at receptor:    | + 3 dBA; |
|              | Impulsivity clearly perceptible at receptor: | + 6 dBA; |
|              | Impulsivity highly perceptible at receptor:  | + 9 dBA. |
- 3.18 The standard states that a difference between the rating level and the background level of around +10 dBA is an indication of a significant adverse impact, depending on the context and a difference of around +5 dBA is likely to be an indication of an adverse impact, also depending on the context. Where the rating level does not exceed the background noise level, this is an indication of the specific sound source having a low impact (depending upon the context).

- 3.19 It should be noted that the context is particularly relevant to this situation. The expectations of residents who are new to an area of existing commercial noise will be more tolerant of the noise than those settled in an area in which new commercial noise is introduced.

#### Summary

- 3.20 The impact of noise upon the proposed development has been assessed using the following recommended maximum noise levels, due to road traffic:
- 35 dB  $L_{Aeq,16hr}$  daytime noise level for bedrooms and living rooms;
  - 30 dB  $L_{Aeq,8hr}$  night-time noise level for bedrooms;
  - 45 dB  $L_{Amax,f}$  night-time noise levels in bedrooms for regular events.
  - Noise from existing building services plant to be assessed under BS 4142: 2014 considering the context of the site.

## **4.0 ENVIRONMENTAL NOISE SURVEYS**

- 4.1 Environmental noise measurements were undertaken from 29<sup>th</sup> June to 6<sup>th</sup> July 2023 to determine the existing noise levels at the site. Ambient noise levels were measured using the following equipment:
- 2x Rion precision sound level meter Type NL-52;
  - Brüel & Kjær acoustic calibrator Type 4231.
- 4.2 The long-term measurement locations are shown in Figure 1 and described below:
- Monitoring location 1 – North of the site overlooking Baldock Street, at first floor level;
  - Monitoring Location 2 - East boundary of the site, overlooking the Jolly Postie Public House, at a height of 2 m above local ground level.
- 4.3 Noise measurements were undertaken in samples of 1 minutes, in terms of the overall A-weighted and octave band  $L_{eq}$ ,  $L_{90}$  and  $L_{max,f}$  noise levels. Measurements were made in accordance with BS 7445:1991 "Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use" [Reference 8].
- 4.4 The instrumentation calibration was checked before and after the survey in accordance with the manufacturer's instructions. No significant drift in calibration was recorded. Calibration of 24 Acoustics' equipment is traceable to National Standards.

- 4.5 All instruments were fitted with environmental weather shields during the surveys. The weather during the survey period was suitable for noise measurements, with wind speeds less than 5 m/s.
- 4.6 The results of the noise survey at Location 1 and 2 are summarised in Table **Error! Reference source not found.** 1 and Table 2 and shown graphically in Appendix B.

| Day and Date          | Noise Level                                          |                                                        |                                       |
|-----------------------|------------------------------------------------------|--------------------------------------------------------|---------------------------------------|
|                       | Daytime Level<br>(07:00 – 23:00)<br>dB LAeq, 16 hour | Night-time Level<br>(23:00 – 07:00)<br>dB LAeq, 8 hour | Night-time<br>Typical,<br>dB LAmax, f |
| Thursday 29/6/2023    | *63                                                  | 56                                                     | 74                                    |
| Friday 30/6/2023      | 64                                                   | 58                                                     | 80                                    |
| Saturday 1/7/2023     | 64                                                   | 55                                                     | 73                                    |
| Sunday 2/7/2023       | 63                                                   | 55                                                     | 74                                    |
| Monday 3/7/2023       | 64                                                   | 55                                                     | 75                                    |
| Tuesday 4/7/2023      | 65                                                   | 57                                                     | 76                                    |
| Wednesday 5/7/2023    | 65                                                   | 57                                                     | 76                                    |
| <b>Representative</b> | <b>64</b>                                            | <b>57</b>                                              | <b>76</b>                             |

**Table 1:** Ambient Noise Levels at Measurement location 1 (\* = incomplete period)

| Day and Date          | Noise Level                                          |                                                        |                                       |
|-----------------------|------------------------------------------------------|--------------------------------------------------------|---------------------------------------|
|                       | Daytime Level<br>(07:00 – 23:00)<br>dB LAeq, 16 hour | Night-time Level<br>(23:00 – 07:00)<br>dB LAeq, 8 hour | Night-time<br>Typical,<br>dB LAmax, f |
| Thursday 29/6/2023    | *55                                                  | 49                                                     | 64                                    |
| Friday 30/6/2023      | 54                                                   | 49                                                     | 67                                    |
| Saturday 1/7/2023     | 54                                                   | 46                                                     | 65                                    |
| Sunday 2/7/2023       | 58                                                   | 49                                                     | 64                                    |
| Monday 3/7/2023       | 58                                                   | 46                                                     | 61                                    |
| Tuesday 4/7/2023      | 53                                                   | 48                                                     | 64                                    |
| Wednesday 5/7/2023    | 53                                                   | 47                                                     | 62                                    |
| <b>Representative</b> | <b>58</b>                                            | <b>48</b>                                              | <b>65</b>                             |

**Table 2:** Ambient Noise Levels at Measurement location 2 (\* = incomplete period)

- 4.7 Note that 24 Acoustics determines the typical night-time maximum noise level to be the tenth highest in this period.

- 4.8 The noise environment at Location 1 was controlled by noise from road traffic, using Baldock Street. Noise levels at Location 2 were affected by plant noise associated with the Jolly Postie Public House. Analysis of the noise data shows that the kitchen extract plant was operational for daytime hours only (approx. 09:00 to 23:00 hours) and other cooling plant was operating intermittently during night-time.

## 5.0 EXISTING PLANT NOISE

- 5.1 Using the measured noise levels, calculations have been undertaken, correcting for distance, to determine the level of noise from existing plant at the Jolly Postie Public House affecting the nearest proposed sensitive windows.
- 5.2 The nearest apartment windows to the existing plant are located on the first floor at approximately 30m from the plant.
- 5.3 The daytime plant does not exhibit tonal or temporal characteristics that would be distinguishable at the nearest noise sensitive receptors. Therefore, no character correction has been applied to the calculations for daytime periods .
- 5.4 For night-time a penalty of intermittency (+ 3 dB) and tonality (+ 2 dB) has been applied.
- 5.5 The calculated noise levels from the plant are described in Tables 3 and 4 and compared to the daytime and night time background noise levels with the plant off, in accordance with BS 4142: 2014.

|                                 | <b>Apartment Closest Living Room Window</b> |
|---------------------------------|---------------------------------------------|
|                                 | <b>Daytime<br/>(09:00 to 23:00 hours)</b>   |
| <b>Background Noise Level</b>   | 46 dB $L_{A90,1h}$                          |
| <b>Specific Noise Level</b>     | 51 dB $L_{Aeq, 1h}$                         |
| <b>Character Correction</b>     | + 0 dB                                      |
| <b>Rating Noise Level</b>       | 51 dB $L_{Ar, 1h}$                          |
| <b>BS 4142 Assessment Level</b> | + 5 dB                                      |

**Table 3** - Assessment of Noise from Existing plant - Daytime

|                                 | <b>Apartment Closest Bedroom Window</b>      |
|---------------------------------|----------------------------------------------|
|                                 | <b>Night time<br/>(23:00 to 07:00 hours)</b> |
| <b>Background Noise Level</b>   | 41 dB $L_{A90,15m}$                          |
| <b>Specific Noise Level</b>     | 41 dB $L_{Aeq, 15m}$                         |
| <b>Character Correction</b>     | + 5 dB                                       |
| <b>Rating Noise Level</b>       | 46 dB $L_{Ar, 15m}$                          |
| <b>BS 4142 Assessment Level</b> | + 5 dB                                       |

**Table 4** - Assessment of Noise from Existing plant – Night-time

- 5.6 The above assessment demonstrates that plant noise levels at the nearest proposed apartment windows will be 5 dB above the background noise level during daytime and night-time periods. This is considered acceptable and a lower than adverse impact under BS 4142: 2014 when taking into account the context of the site. As new dwellings are being introduced near to existing commercial noise, noise from the plant forms part of the existing acoustic environment and residents' expectations will be more tolerant of the commercial noise.
- 5.7 Suitable internal noise levels can be achieved within the proposed apartments, via the appropriate specification of the building façade elements as assessed in the following section.

#### External Amenity Areas

- 5.8 The proposed development includes a communal garden to the east of the proposed building.
- 5.9 In order to reduce noise levels from plant at the adjacent public house, it is recommended to install a solid barrier on the east boundary of the site as shown in Figure 2. The barrier should provide a minimum superficial weight of 10 kg/m<sup>2</sup> (e.g. close-boarded timber fence) with a minimum height of 2.4 m above local ground level.
- 5.10 Based on the measured noise levels, distance from the plant and screening from the proposed barrier noise levels in the communal garden are expected to be below 50 dB  $L_{Aeq,16hr}$ , which is considered acceptable in planning terms.

## 6.0 CALCULATIONS AND NOISE MITIGATION STRATEGY

### Internal Noise Levels

- 6.1 Calculations have been undertaken using the noise measurement results to determine the level of noise break-in to the proposed development, to ensure that the overall noise levels do not exceed 35 dB  $L_{Aeq,16hr}$  during the day and 30 dB  $L_{Aeq,8hr}$  at night (and also not regularly exceed 45 dB  $L_{Amax,f}$  at night). In addition, noise from building services plant at the adjacent pub shall not exceed 30 dB  $L_{Aeq,1hr}$  during the day and 25 dB  $L_{Aeq,15min}$  at night within habitable rooms.
- 6.2 The analysis given below has been based on 24 Acoustics' understanding that external walls will comprise a cavity masonry construction, which would typically achieve a minimum sound insulation performance of 52 dB  $R_w$ .
- 6.3 It is understood that mechanical ventilation (MVHR) is to be provided to all habitable rooms within the apartments, with no trickle ventilators or passive ventilation openings in the apartment façades. The ventilation strategy must also achieve other relevant requirements as per Building Regulations Approved Document F [Reference 9], to be confirmed by others.
- 6.4 Calculations have been based on the drawings by On Architecture, provided to 24 Acoustics in July 2023. If the room sizes or elevations are varied, then these calculations should be updated accordingly.
- 6.5 Location 1 was located at the same distance from Baldock Street as the proposed building façades. Monitoring location 2 is 20m away from the proposed building façade.
- 6.6 The minimum acoustic requirements for windows apply to all new habitable rooms on all floors of the development. The required glazing specifications are summarised in Table 5 below.

| Minimum SRI (dB) per Octave Band Centre Frequency (Hz) |    |     |     |     |    |    |    |
|--------------------------------------------------------|----|-----|-----|-----|----|----|----|
|                                                        | 63 | 125 | 250 | 500 | 1k | 2k | 4k |
| Glazing                                                | 20 | 24  | 20  | 25  | 35 | 38 | 35 |

**Table 5:** Minimum sound insulation performance of glazing.

- 6.7 In making a comparison with the values in Table 5, it is important that the glazing figures used are the result of tests in accordance with ISO 10140, Part 2: 2010 and that the quoted minimum sound reduction specifications are met by the entire glazing system as a whole, including frames, seals, any insulated panels and not just the glass. The requirements also apply to any glazed doors to habitable rooms.
- 6.8 In order to assist with the selection process, the following glazing configuration, if installed correctly, would be capable of achieving the required sound reduction performance:
- GL1: 4 mm glass; 12 mm cavity (minimum); 4 mm glass (or equivalent). Minimum 31 dB  $R_w$ ;
- 6.9 It is considered that with the proposed mitigation measures as detailed above, suitable internal noise levels can be achieved for the proposed dwellings.

#### Separating Elements between Commercial and Residential

- 6.10 It is recommended that the sound insulation of party floors and party walls separating residential properties from the ground floor commercial unit be enhanced above the minimum requirement of Part E of the Building Regulations [Reference 10]. These party walls and floors should be specified and built to achieve a minimum sound insulation performance of 55 dB  $D_{nT,w} + C_{tr}$ , i.e 10 dB above the minimum Part E requirements.

## 7.0 CONCLUSIONS

- 7.1 24 Acoustics Ltd has been appointed by McCarthy Stone to provide a noise impact assessment for proposed retirement living apartments at Baldock Street, Royston, Hertfordshire.
- 7.2 An environmental noise survey has been carried out at the site to determine existing noise levels during daytime and night-time periods. The site is affected by noise from road traffic, using Baldock Street and noise from plant serving the Jolly Postie Public House.
- 7.3 A BS 4142 assessment of plant serving Jolly Postie Public House indicates that a lower than adverse noise impact is likely to result at all times, taking into account the context of the site.
- 7.4 Recommendations have been provided in relation to the glazing and ventilation strategy to ensure that noise levels within habitable rooms would comply with maximum internal levels of 35 dB  $L_{Aeq,16hr}$  during the daytime, 30 dB  $L_{Aeq,8hr}$  at night and 45 dB  $L_{Amax,f}$  at night for regular events.
- 7.5 A specification for a barrier has been provided, in order to achieve suitable external noise levels within communal garden areas.
- 7.6 Party walls and floors separating residential properties from the ground floor commercial unit shall be designed to achieve an enhanced sound insulation performance over and above the requirements of Approved Document E.
- 7.7 It is concluded that, with the recommended measures given, internal noise levels will be acceptable for future occupiers of the scheme.

## REFERENCES

1. Department for Communities and Local Government. National Planning Policy Framework, Revised July 2021.
2. DEFRA. Noise Policy Statement for England, 2010.
3. Department of Communities and Local Government. National Planning Practice Guidance, July 2019.
4. Association of Noise Consultants, Institute of Acoustics, Chartered Institute of Environmental Health. Professional Practice Guidance on Planning and Noise, May 2017.
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6. World Health Organisation. Guidelines for Community Noise, 2000.
7. BS 4142: 2014+A1:2019 Methods for Rating Industrial and Commercial Sound, 2014.
8. British Standards Institution. British Standard 7445:1991 Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use, 1991.
9. Building Regulations. Approved Document F - Ventilation, 2010.
10. Building Regulations. Approved Document E – Resistance to the Passage of Sound, 2010.



|                                            |                                                         |                      |                                                                                                      |
|--------------------------------------------|---------------------------------------------------------|----------------------|------------------------------------------------------------------------------------------------------|
| <b>Project:</b><br>Baldock Street, Royston | <b>Title:</b><br>Aerial view and measurement locations. |                      | <br>24Acoustics |
| <b>DWG No:</b> Figure 1                    | <b>Scale:</b> N.T.S.                                    | <b>Rev:</b> 0        |                                                                                                      |
| <b>Date:</b> July 2023                     | <b>Drawn By:</b> AP                                     | <b>Job No:</b> 10145 |                                                                                                      |



## APPENDIX A – ACOUSTIC TERMINOLOGY

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

For variable sources, such as traffic, a difference of 3 dB is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dB. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dB corresponds to a doubling/ halving in perceived loudness.

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

i) The  $L_{Amax}$  noise level

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

ii) The  $L_{Aeq}$  noise level

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

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

iii) The  $L_{A10}$  noise level

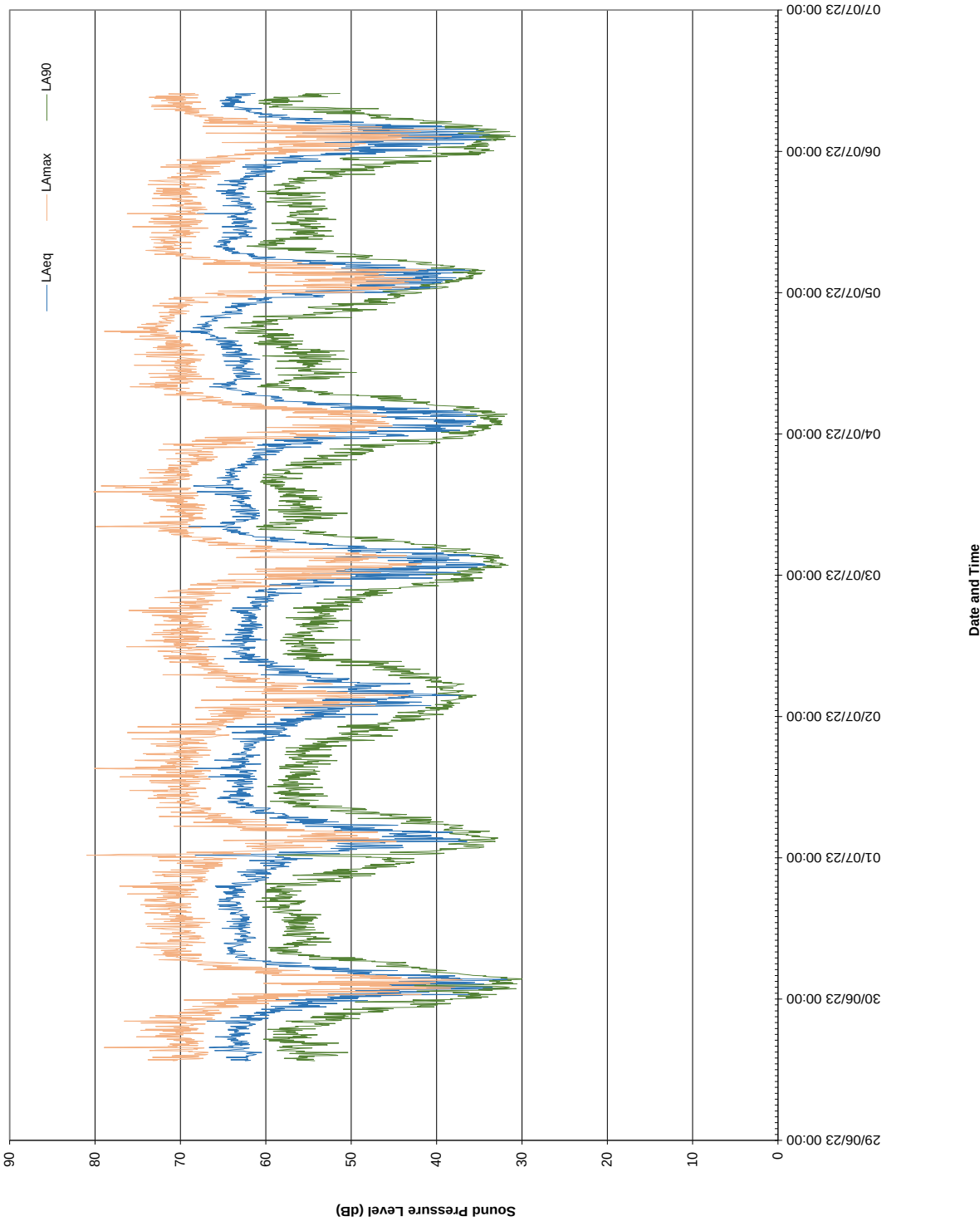
This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

iv) The  $L_{A90}$  noise level

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

APPENDIX B – ENVIRONMENTAL NOISE SURVEY RESULTS

Location 1 - Baldock Street, Royston, Hertfordshire  
Noise Survey  
29th June - 6th July 2023



Location 2 - Baldock Street, Royston, Hertfordshire  
Noise Survey  
29th June - 6th July 2023

