



Land at Trojan Close, Swansea

Noise Assessment for Planning Application

12<sup>th</sup> January 2026

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# 1. INTRODUCTION

## 1.1. Overview

inacoustic has been commissioned to assess the impact of potential noise arising from a commercial development on land off Trojan Close, Crymlyn Burrows, Skewen, Swansea SA1 8QA.

The following technical noise assessment has been produced to accompany a Planning Application to Neath Port Talbot County Borough Council and is based upon environmental noise measurements undertaken at the site and a subsequent 3-dimensional noise modelling exercise.

This noise assessment is necessarily technical in nature; therefore a glossary of terms is included in Appendix A to assist the reader.

## 1.2. Scope and Objectives

The scope of the noise assessment can be summarised as follows:

- A sound monitoring survey was undertaken at a discrete location representative of the closest noise-sensitive receptors to the Site;
- An assessment of potential noise impacts with respect to the prevailing acoustic conditions at existing off-site receptors; and
- Recommendation of mitigation measures, where necessary, to comply with the requirements of BS4142:2014+A1:2019<sup>1</sup>.

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<sup>1</sup> British Standard Institution. BS 4142:2014+A1: 2019: Methods for rating and assessing industrial and commercial sound.

## 2. LEGISLATION AND POLICY FRAMEWORK

The development proposals for the Site are guided by the following legislation, policy directives and guidance:

### 2.1. Legislation

#### 2.1.1. Well-being of Future Generations (Wales) Act 2015

The Well-being of Future Generations (Wales) Act 2015 has a number of wellbeing goals to achieve through implementing sustainable development. Changes in noise levels can have an impact on the health of habitat and humans, as such the goals to create 'a resilient Wales' and 'a healthier Wales' are applicable.

### 2.2. National Policy

#### 2.2.1. Future Wales: The National Plan 2040

The National Plan states the following under the heading Developing infrastructure responsibly:

*When proposing new transport infrastructure or new development, average population exposure to air and noise pollution should be reduced and soundscapes improved where it is practical and feasible to do so. At the very least, exposure to pollution should be minimised. This will include taking into account the long-term effects of current and predicted levels of air and noise pollution on individuals, society and the environment arising as a result of proposals for transport infrastructure or development.*

#### 2.2.2. Planning Policy Wales

The Government's planning policies for Wales are contained in Planning Policy Wales (Edition 12, February 2024). The policy provides overarching requirements for developments to adequately control noise pollution, to provide appropriate soundscapes and to incorporate good acoustic design.

The policy is supplemented by the Noise and Soundscape Plan 2023-2028, which provides more detailed guidance on planning for a new development, but does not set out specific assessment methods or criteria. The guidance in this document has been used to inform a qualitative assessment of the effect the proposed development could have on the local soundscape.

### 2.2.3. Technical Advice Note (Wales) 11

This note provides advice on how the planning system in Wales can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business.

It outlines some of the main considerations which local planning authorities should take into account in drawing-up development plan policies and when determining planning applications for development which will either generate noise or be exposed to existing noise sources.

## 3. ASSESSMENT FRAMEWORK

### 3.1. British Standards

#### 3.1.1. BS4142:2014+A1:2019

BS4142:2014+A1:2019 sets out a method to assess the likely effect of sound from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises, on people who might be inside or outside a dwelling or premises used for residential purposes in the vicinity.

The procedure contained in BS4142:2014+A1:2019 for assessing the effect of sound on residential receptors is to compare the measured or predicted sound level from the source in question, the  $L_{Aeq,T}$  'specific sound level', immediately outside the dwelling with the  $L_{A90,T}$  background sound level.

Where the sound contains a tonality, impulsivity, intermittency and other sound characteristics, then a correction depending on the grade of the aforementioned characteristics of the sound is added to the specific sound level to obtain the  $L_{Ar,Tr}$  'rating sound level'. A correction to include the consideration of a level of uncertainty in sound measurements, data and calculations can also be applied when necessary.

BS4142:2014+A1:2019 states: *"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs"*. An estimation of the impact of the specific sound can be obtained by the difference of the rating sound level and the background sound level and considering the following:

- *"Typically, the greater this difference, the greater the magnitude of the impact."*
- *"A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context."*
- *"A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context."*
- *"The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."*

The periods associated with day or night, for the purposes of the Standard, are considered to be 07.00 to 23.00 and 23.00 to 07.00, respectively.

## 3.2. Other Guidance

### 3.2.1. Relative Change in Ambient Noise Level

In circumstances where a noise environment may be altered by addition or removal of a noise source, considered to be largely anonymous or within the prevailing acoustic character of an area, for example, changes to traffic quantum or patterns, it is normal to consider the relative change in ambient noise level. The assessment, therefore, considers this phenomenon to add context.

The impact scale adopted in this assessment is shown in below, which relates to established human responses to noise, in line with 'Table 7-12 Effect Descriptors' of the IEMA Guidelines.

TABLE 1: IMPACT SCALE FOR COMPARISON OF FUTURE NOISE AGAINST EXISTING NOISE

| Noise Level Change<br>dB(A) | Subjective Response                         | Significance       |
|-----------------------------|---------------------------------------------|--------------------|
| Less than 1.0               | Not perceptible                             | Negligible         |
| 1.0 – 2.9                   | Barely perceptible                          | Minor impact       |
| 3.0 – 4.9                   | Noticeable                                  | Moderate impact    |
| 5.0 – 9.9                   | Up to a doubling or halving of loudness     | Substantial impact |
| 10.0 or more                | More than a doubling or halving of loudness | Major impact       |

The criteria above reflect the key benchmarks that relate to human perception of sound. A change of 3 dB(A) is generally considered to be the smallest change in environmental noise that is perceptible to the human ear. A 10 dB(A) change in noise represents a doubling or halving of the subjective perception of loudness. The difference between the minimum perceptible change and the doubling or halving of the loudness is split to provide greater definition to the assessment of changes in noise level. It is considered that the criteria specified in Table 1 provide a good indication as to the likely significance of changes in noise levels in this case and can be used to inform the context in which the sound occurs in order to assess the impact of noise from the proposed development.

## 4. SITE DESCRIPTION

### 4.1. Site and Surrounding Area

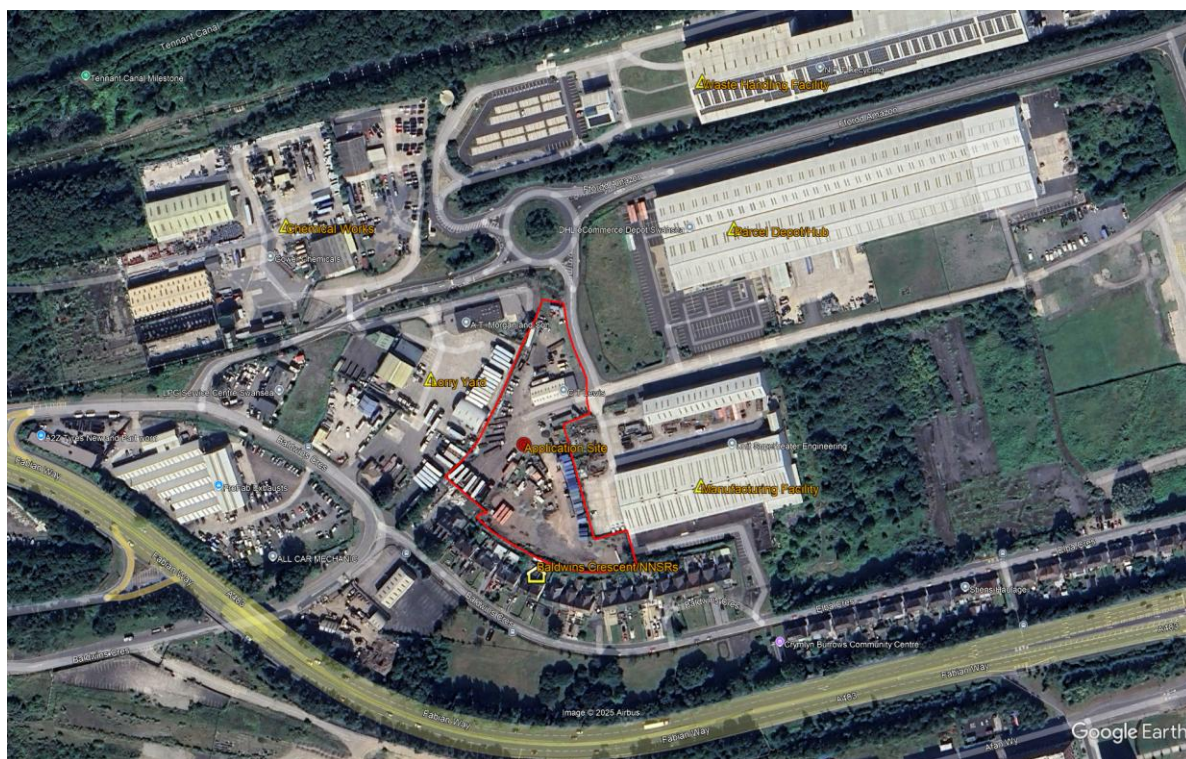
The Application Site sits at the western end of Trojan Close, Crymlin Burrows, Swansea, within a densely industrialised area that comprises a 24-hour manufacturing facility to the east (Unit Superheater Engineering Ltd); a 24-hour DHL distribution centre to the north-east; the Neath Port Talbot Council Waste Recycling Centre to the north; a chemical works (Gower Chemicals) to the north-west; a lorry yard (AT Morgan & Son) to the west; various vehicle maintenance units to the north and west; with the closest noise-sensitive receptors to the site comprising the residential properties on Baldwins Crescent, to the south.

The application area and key surrounding features can be seen in Figure 1.

The sound environment across the area is dominated by road traffic noise arising from vehicles on Fabian Way, to the south, plus the sounds of commercial activity, including machine tools, impact guns, reversing alarms, etc, arising from the commercial uses surrounding the site.

Although currently operational as a storage facility and haulage yard, no noise was audibly arising from within the Application Site, which was noted to be largely inactive.

FIGURE 1: SITE LOCATION



## 4.2. Site History

The Application Site previously accommodated a boat storage yard and workshop, prior to the purchase by CT Lewis Ltd, who believed that storage uses were established at the site. Unfortunately, the planning status of the site has since been found to be uncertain, with ambiguity existing as to whether the previous site owner had received a grant of planning permission or a certificate of lawful use for parts of the site for the historic storage uses or the workshop during its operation or prior to its sale, resulting in CT Lewis Ltd now attempting to regularise this use via a planning application.

The southern portion of the site, immediately adjacent to the residential uses on Baldwins Crescent historically comprised allotment gardens, which had apparently been disused since the 1970s, and had consequently become heavily overgrown and used extensively for fly tipping, particularly along the southern boundary with Baldwins Crescent.

CT Lewis Ltd has since cleared the fly-tipped waste and overgrown vegetation and applied a permeable hardcore surface to the majority of the site, in order to improve the area, and aid its usefulness for storage. The existing maintenance shed and office building on the site have also been retained and partially refurbished in-situ.

## 4.3. Proposed Development Overview

The Application seeks to regularise the use of the site for B8 storage purposes, with ancillary office and maintenance workshop functions.

CT Lewis Ltd operate a fleet of five of their own HGV tractor units but also offer trailer and vehicle storage for other hauliers and vehicle recovery contractors at the site, with a small number of self-storage units (shipping containers) located along the eastern boundary. Vehicle movements at the site are infrequent, with, typically no more than one HGV arrival and departure in an hour.

The site would require a permission that permits 24-hour operation for flexibility, and to maintain consistency with neighbouring commercial uses; however, night-time use is and would be infrequent, with any HGV movements during this time being subject to the deactivation of reverse alarms, in order to avoid disturbance to neighbouring receptors.

There are no fixed site plans, with regard to what will be stored where; however, the basic principle will be to utilise the whole site as a storage facility / haulage yard, with maintenance and clerical uses within the existing buildings and a bank of inward-facing shipping containers located along the southern boundary with Baldwins Crescent, in order to introduce a buffer and barrier between any vehicular activities and the closest receptors.

It is proposed to continue many of the current operational protocols, whereby vehicles likely to be moved on a regular basis, or during more sensitive periods of the day or night are located at or north of the centre of the site, such that any noise effects upon the neighbouring receptors are minimised.

## 5. MEASUREMENT METHODOLOGY

### 5.1. General

The prevailing noise conditions in the area have been determined by an environmental noise survey conducted between Tuesday 6<sup>th</sup> and Thursday 8<sup>th</sup> January 2026.

### 5.2. Measurement Details

All noise measurements were undertaken by a consultant certified as competent in environmental noise monitoring, and, in accordance with the principles of BS 7445<sup>2</sup>.

All acoustic measurement equipment used during the noise survey conformed to Type 1 specification of British Standard 61672<sup>3</sup>. A full inventory of this equipment is shown in Table 2 below.

TABLE 2: INVENTORY OF SOUND MEASUREMENT EQUIPMENT

| Position | Make, Model & Description         | Serial Number | Calibration Certificate Number | Calibration Due Date |
|----------|-----------------------------------|---------------|--------------------------------|----------------------|
| MPI      | Rion NL-31 Sound Level Meter      | 00110040      | 1176252                        | 12/02/2027           |
|          | Rion NH-21 Preamplifier           | 00142         |                                |                      |
|          | Rion UC-53A Microphone            | 306449        |                                |                      |
|          | Cirrus CR:515 Acoustic Calibrator | 72886         | 1176254                        | 12/02/2026           |

The sound measurement equipment used during the survey was field calibrated at the start and end of the measurement period. A calibration laboratory has calibrated the field calibrator used within the twelve months preceding the measurements. A drift of less than 0.2 dB in the field calibration was found to have occurred on the sound level meter.

The weather conditions during the utilised part of the survey were as follows:

- Tuesday 6<sup>th</sup> January – cold at deployment; 3-4°, overcast and calm with a 4ms<sup>-1</sup> westerly breeze, with light rain starting at 14:00, becoming heavier from 16:00 to 20:00, with a ~5ms<sup>-1</sup> south-westerly breeze. Dry from 21:00, with a 4ms<sup>-1</sup> west-north-westerly breeze and temperatures around 5°.
- Dry overnight into Wednesday 7<sup>th</sup> January, with temperatures between 3 and 4°, with a 2-3ms<sup>-1</sup> west-north-westerly breeze.
- Wednesday 7<sup>th</sup> January – dry throughout the day, with a 1-2ms<sup>-1</sup> north-westerly breeze, and temperatures between 3-5°, with drizzle/very light rain from 19:00, turning dry from 23:00, and overnight into Thursday 8<sup>th</sup>, with temperatures remaining at ~5o and winds of 2-3ms<sup>-1</sup> from the east-south-east.

Data from Wednesday 7<sup>th</sup>, overnight to Thursday 8<sup>th</sup> January has consequently been used in the analysis.

<sup>2</sup> British Standard 7445: 2003: Description and measurement of environmental noise. BSI

<sup>3</sup> British Standard 61672: 2003: Electroacoustics. Sound level meters. Part 1 Specifications. BSI.

The microphone was fitted with a protective windshield for the measurement, which is described in Table 3, with a plan indicating its location shown in Figure 2.

TABLE 3: MEASUREMENT POSITION DESCRIPTION

| Measurement Position | Description                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| MP1                  | <p>A largely unattended daytime and night-time measurement of sound under free-field conditions, at a height of 1.6 metres above local ground level, located at the southern edge of the site, to the rear of Baldwins Crescent.</p> <p>The sound environment was dominated by road traffic noise arising from vehicles using Fabian Way, with contributions arising from commercial activities within the neighbouring premises.</p> |

FIGURE 2: MEASUREMENT POSITION



## 5.3. Results Summary

The summarised results of the environmental noise measurements are presented in Table 4, with time histories and statistical analyses presented under Appendix B.

TABLE 4: SUMMARY OF NOISE MEASUREMENT RESULTS

| Measurement Position | Period                       | Noise Level, dB    |                      |                  |                   |
|----------------------|------------------------------|--------------------|----------------------|------------------|-------------------|
|                      |                              | L <sub>Aeq,T</sub> | L <sub>A90</sub>     | L <sub>A10</sub> | L <sub>Amax</sub> |
| MP1                  | Daytime<br>07:00-19:00       | 51                 | Mean: 47<br>Mode: 48 | 52               | 68                |
|                      | Evening<br>19:00-23:00       | 40                 | Mean: 36<br>Mode: 35 | 41               | 50                |
|                      | Night-time<br>23:00-05:00    | 41                 | Mean: 35<br>Mode: 34 | 43               | 54                |
|                      | Early Morning<br>05:00-07:00 | 49                 | Mean: 46<br>Mode: 44 | 51               | 58                |

## 5.4. Discussion

As the site is already operational, with this application essentially being retrospective, an assessment in accordance with BS4142 should be theoretically possible on the basis of the measurement data, which has been logged in 5-minute intervals. The nature of the site activity is, however, so infrequent and of such a low intensity that a measurement-based BS4142 assessment is not possible, with the overall observation being that site activities do not measurably affect the ambient sound level at the closest receptor locations, with that level being governed by other residual or commercial sources of noise in the area.

Consequently, the measured data has been adopted as a baseline, to be used to determine the residual and background sound levels, for the purposes of aiding a prediction-based assessment, which follows within the next section of this report.

## 6. OPERATIONAL NOISE ASSESSMENT

### 6.1. Noise Modelling

#### 6.1.1. General

The site is proposed to continue in a format close to that which currently is operated, which comprises open air B8 storage, with ancillary workshop and clerical office functions. The assessment considers a future operating profile with the addition of a continuous row of shipping containers along the southern boundary to the rear of Baldwin's Crescent, with doors facing into the site, such that an operational buffer zone is introduced alongside a barrier/screening function.

As the development requires the flexibility to operate during the night-time period, the impact of limited vehicle movements during this period has been considered. No operation of the workshop would occur outside of core daytime hours.

#### 6.1.2. Operational Assumptions

The following input data has been considered within the assessment:

- Vehicular activity on the basis of 1x HGV arriving and 1x HGV departing to/from the centre of the site, during a daytime 1-hour period;
- 1x HGV arriving and 1x HGV departing to/from the centre of the site, during an evening 1-hour period
- Vehicular activity on the basis of 1x HGV departing from the area of the site opposite the entrance, during a night-time 15-minute period;
- Sustained internal sound levels within the workshop of 70 dB(A), during the day;
- An electric forklift operating in the area adjacent to the workshop frontage on the basis of a 20% on-time, during the day; and
- Roller shutter doors to the workshop maintained in an open position during operations.

#### 6.1.3. Source Data

The A-weighted sound source levels associated with the Proposed Development, based on archive data, can be seen below in Table 5.

TABLE 5: SOUND SOURCE DATA

| Source                            | Distance / Description | Noise Level - dB   |      |
|-----------------------------------|------------------------|--------------------|------|
|                                   |                        | L <sub>Aeq,T</sub> | SEL  |
| HGV arriving                      | 10 metres              | -                  | 77.0 |
| HGV reversing (inc reverse alarm) | 10 metres              | -                  | 82.0 |
| HGV starting and departing        | 10 metres              | -                  | 76.0 |
| Electric Forklift Truck           | 1 metre                | 72.0               | -    |
| Internal Level                    | Internal Reverberant   | 70.0               | -    |

#### 6.1.4. Building Envelope

In terms of the acoustic performance of the building envelope, the sound reduction statistics set out in Table 6 have been adopted.

TABLE 6: SOUND REDUCTION INDEX OF BUILDING COMPONENTS

| Component                 | Type / Material                                                      | SRI – dB(A) |
|---------------------------|----------------------------------------------------------------------|-------------|
| Wall Cladding             | Original Cementitious Board Cladding and Profiled Steel Overboarding | 28          |
| Roof Cladding             | Corrugated Cementitious Board                                        | 25          |
| Main Roller Shutter Doors | Steel Roller Shutter - Open                                          | 0           |

#### 6.1.5. Calculation Process

Calculations were carried out using Cadna/A, which undertakes its calculations in accordance with guidance given in ISO9613.

#### 6.1.6. Sound Data Assumptions

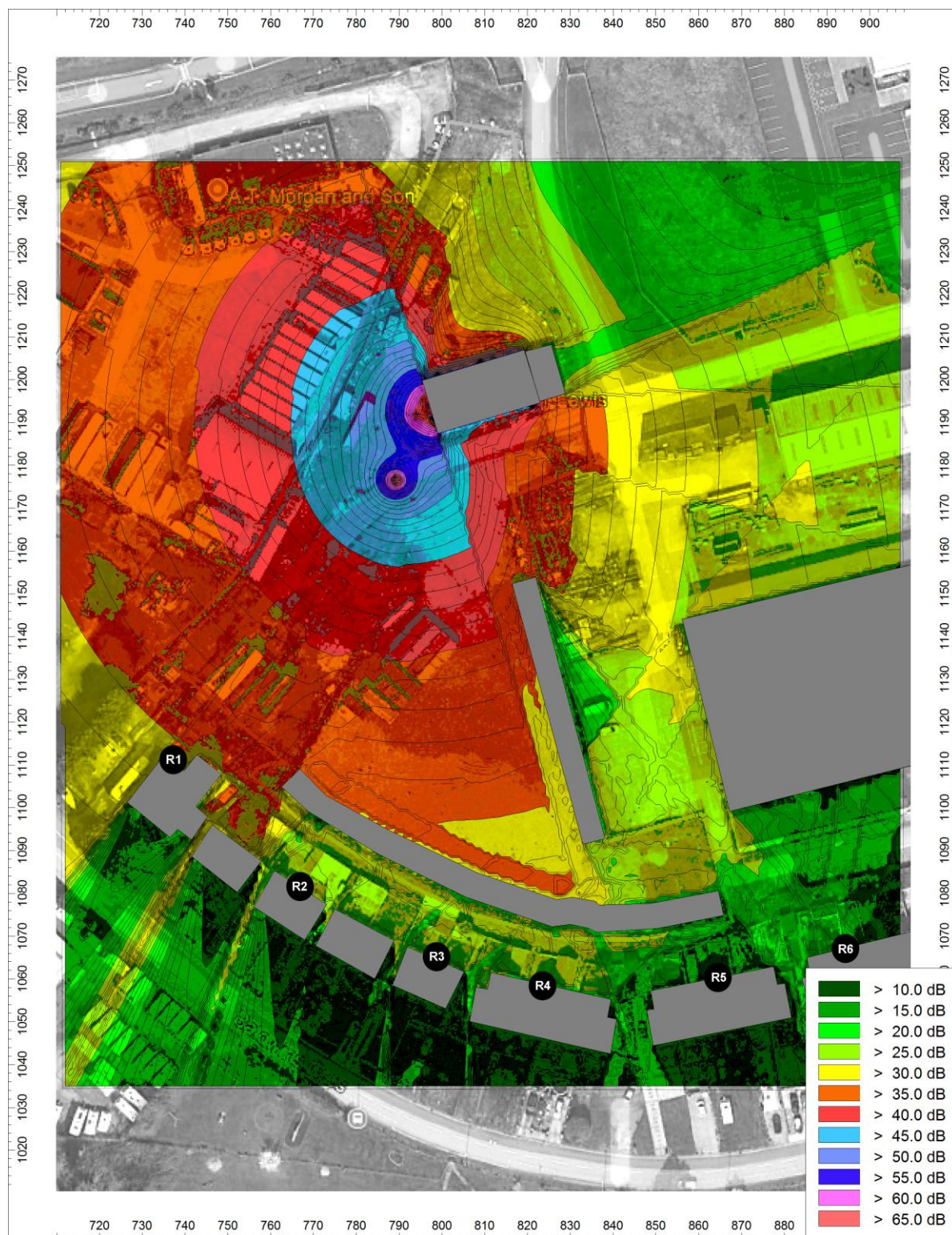
Given that the land between Proposed Development and nearest receptors has a hard bias, the ground factor has been set to 0.2 in the calculation software.

It has been assumed that all processes may occur simultaneously, representing a worst-case scenario.

#### 6.1.7. Specific Sound Level Map

A sound map of the predicted specific sound level arising from peak cumulative daytime operations at the closest receptors to the Site, at ground floor level can be seen in Figure 3.

FIGURE 3: SPECIFIC SOUND LEVEL MAP OF CUMULATIVE OPERATIONS – CORE DAYTIME



### 6.1.8. Specific Sound Level Summary

The predicted specific sound level arising from typical operations at the closest receptors to the Site can be seen below in Table 7.

The daytime and evening levels relate to a ground floor receptor, while the night-time and early morning levels have been predicted at 1<sup>st</sup> floor level, to represent bedrooms.

TABLE 7: PREDICTED SPECIFIC SOUND LEVEL SUMMARY

| NSR | Period                | Specific Sound Level $L_{Aeq,T}$ - dB |
|-----|-----------------------|---------------------------------------|
| R1  | Day / Evening         | 35 / 27                               |
| R2  | Day / Evening         | 26 / 18                               |
| R3  | Day / Evening         | 25 / 18                               |
| R4  | Day / Evening         | 24 / 18                               |
| R5  | Day / Evening         | 16 / 14                               |
| R6  | Day / Evening         | 21 / 16                               |
| R1  | Night / Early Morning | 28                                    |
| R2  | Night / Early Morning | 21                                    |
| R3  | Night / Early Morning | 21                                    |
| R4  | Night / Early Morning | 21                                    |
| R5  | Night / Early Morning | 17                                    |
| R6  | Night / Early Morning | 16                                    |

## 6.2. Assessment

### 6.2.1. Rating Penalty Principle

Section 9 of BS4142:2014+A1:2019 describes how the rating sound level should be derived from the specific sound level, by determining a rating penalty.

BS4142:2014+A1:2019 states:

*“Certain acoustic features can increase the significance of impact over 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, add a character correction to the specific sound level to obtain the rating level. This can be approached in three ways:*

- a) subjective method;*
- b) objective method for tonality;*
- c) reference method.”*

The subjective method has been adopted to derive the rating sound level from the specific sound level. This is discussed in Section 9.2 of BS4142:2014+A1:2019, which states:

*“Where appropriate, establish a rating penalty for sound based on a subjective assessment of its characteristics. This would also be appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed.*

*Correct the specific sound level if a tone, impulse or other characteristics occurs, or is expected to be present, for new or modified sound sources.”*

BS4142:2014+A1:2019 defines four characteristics that should be considered when deriving a rating penalty, namely; tonality; impulsivity; intermittency; and other sound characteristics, which are defined as:

#### **Tonality**

A rating penalty of +2 dB is applicable for a tone which is “*just perceptible*”, +4 dB where a tone is “*clearly perceptible*”, and +6 dB where a tone is “*highly perceptible*”.

#### **Impulsivity**

A rating penalty of +3 dB is applicable for impulsivity which is “*just perceptible*”, +6 dB where it is “*clearly perceptible*”, and +9 dB where it is “*highly perceptible*”.

#### **Other Sound Characteristics**

BS4142:2014+A1:2019 states that where “*the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distance against the residual acoustic environment, a penalty of +3 dB can be applied.*”

## Intermittency

BS4142:2014+A1:2019 states that when the “specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time ... if the intermittency is readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied.”

### 6.2.2. Rating Penalty Assessment

Considering the content of Section 6.2.1, an assessment of the various sound sources associated with the Proposed Development, in terms of whether any rating penalties are applicable, and has been detailed in Table 8.

TABLE 8: RATING PENALTY ASSESSMENT

| Source                      | Tonality | Impulsivity | Intermittency | Other Sound Characteristics | Discussion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----------------------------|----------|-------------|---------------|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Typical internal operations | 0 dB     | 0 dB        | 0 dB          | 0 dB                        | Workshop activities were noted to be typically inaudible at the site boundary, as a result of low source noise levels, operation within the building envelope, separation distance and the prevailing acoustic environment.<br><br>Consequently, no feature correction is considered necessary for this source.                                                                                                                                                                                                                                                                                                                                                                             |
| Vehicle movements           | +2 dB    | 0 dB        | 0 dB          | 0 dB                        | Vehicle movements are within the acoustic character of the area, with the site and receptors being surrounded by roads and other commercial premises with extensive external operations.<br><br>Reverse alarms during the daytime operation do have the potential to give rise to just perceptible tonality at the closest receptor; however, the operational protocols at the site mean that these alarms are deactivated during any night-time activities, for reasons of low necessity (as the yard is otherwise unoccupied at this time) and acoustic sympathy for adjacent receptors.<br><br>Consequently, a +2 dB acoustic feature for tonality is applied for the daytime uses only. |

In summary, a rating penalty of +2 dB has been applied to the typical daytime operation of the Proposed Development.

## 6.3. Uncertainty

BS4142:2014+A1:2019 requires that the level of uncertainty in the measured data and associated calculations is considered in the assessment. The Standard recommends that steps should be taken to reduce the level of uncertainty.

### 6.3.1. Measurement Uncertainty

BS4142:2014+A1:2019 states that measurement uncertainty depends on a number of factors, including the following, which are applicable to the Proposed Development:

- “
- ...
    - b) *the complexity and level of variability of the residual acoustic environment;*
    - ...
      - d) *the location(s) selected for taking the measurements;*
      - ...
        - g) *the measurement time intervals;*
        - h) *the range of times when the measurements have been taken;*
        - i) *the range of suitable weather conditions during which measurements have been taken;*
        - ...
          - k) *the level of rounding of each measurement recorded; and*
          - l) *the instrumentation used.”*

Each of the measurement uncertainty factors outlined above have been considered and discussed in Table 9.

TABLE 9: MEASUREMENT UNCERTAINTY FACTORS

| Measurement Uncertainty Factor Reference | Level of Uncertainty | Discussion                                                                                                                                                                                    |
|------------------------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| b)                                       | 0 dB                 | Residual acoustic environment is relatively constant, hence no correction for a complex residual acoustic environment.                                                                        |
| d)                                       | 0 dB                 | Measuring adjacent to the closest affected receptor to the site, has enabled the determination of the worst-case background level.                                                            |
| g)                                       | 0 dB                 | Measurement time intervals were set in accordance with BS4142:2014+A1:2019, hence no further correction needs to be made.                                                                     |
| h)                                       | 0 dB                 | Measurements were undertaken over a continuous 3-day time period.                                                                                                                             |
| i)                                       | 0 dB                 | No periods of significant wind or precipitation were noted during the utilised part of the measurement. The period of the survey where rain was noted to occur was removed from the analysis. |
| k)                                       | 0 dB                 | Measured values were rounded to 1.0 dB, therefore rounding would not have had a significant impact on the overall typical background sound levels.                                            |
| l)                                       | 0 dB                 | The acoustic measurement equipment accorded with Type 1 specification of British Standard 61672, and were deployed with appropriate wind shields.                                             |

In summary, no uncertainty budget has been considered in the assessment, to account for measurement uncertainty.

### 6.3.2. Calculation Uncertainty

BS4142:2014+A1:2019 states that calculation uncertainty depends on a number of factors, including the following, which are applicable to the Proposed Development:

- “ ...
- b) uncertainty in the operation or sound emission characteristics of the specific sound source and any assumed sound power levels;*
  - c) uncertainty in the calculation method;*
  - d) simplifying the real situation to “fit” the model (user influence on modelling); and*
  - e) error in the calculation process.”*

Each of the calculation uncertainty factors outlined above have been considered and discussed in Table 10.

TABLE 10: CALCULATION UNCERTAINTY FACTORS

| Calculation Uncertainty Factor Reference | Level of Uncertainty | Discussion                                                                                                                                                                                            |
|------------------------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| b)                                       | 0 dB                 | Sound source levels are based on robust archive data and worst-case assumptions of likely operations, informed by observations at the site.                                                           |
| c)                                       | 0 dB                 | Calculations were undertaken in accordance with ISO 9613-2, which is considered a “ <i>validated method</i> ” by BS4142:2014+A1:2109.                                                                 |
| d)                                       | 0 dB                 | The real situation has not been simplified for the purposes of this assessment; however, an operational scenario has been assumed for the purposes of the assessment.                                 |
| e)                                       | 0 dB                 | ISO 9613-2 indicates that there is a $\pm 3$ dB accuracy to the prediction method, however, no corrections are considered necessary, given the unlikely nature of the worst-case scenario considered. |

In summary, no uncertainty budget has been considered in the assessment, to account for calculation uncertainty.

The overall uncertainty is considered to be small enough that it would not affect the conclusions of the assessment.

### 6.3.3. Rating Sound Level

Incorporating the rating penalties detailed in Section 6.2.2 with the predicted specific sound levels, as detailed in , the rating sound levels have been derived and have been detailed in Table 11 below.

TABLE 11: RATING SOUND LEVELS

| NSR | Cumulative Specific Sound Level (dB) |         |                       | Rating Sound Level (dB) |         |                       |
|-----|--------------------------------------|---------|-----------------------|-------------------------|---------|-----------------------|
|     | Day                                  | Evening | Night / Early Morning | Day                     | Evening | Night / Early Morning |
| 1   | 35                                   | 27      | 28                    | 37                      | 27      | 28                    |
| 2   | 26                                   | 18      | 21                    | 28                      | 18      | 21                    |
| 3   | 25                                   | 18      | 21                    | 27                      | 18      | 21                    |
| 4   | 24                                   | 18      | 21                    | 26                      | 18      | 21                    |
| 5   | 16                                   | 14      | 17                    | 18                      | 14      | 17                    |
| 6   | 21                                   | 16      | 16                    | 23                      | 16      | 16                    |

### 6.3.4. BS4142:2014+A1:2019 Assessment

The rating sound level, as calculated from the predicted specific sound level, has been assessed in accordance with BS4142:2014+A1:2019, at all NSRs. The resultant assessment summary can be seen in Table 12.

TABLE 12: BS4142:2014+A1:2019 ASSESSMENT SUMMARY

| NSR     | Rating Sound Level (dB) | Background Sound Level (dB) | Excess of Rating over Background Sound Level (dB) |
|---------|-------------------------|-----------------------------|---------------------------------------------------|
| Day     |                         |                             |                                                   |
| 1       | 37                      | 47                          | -10                                               |
| 2       | 28                      |                             | -19                                               |
| 3       | 27                      |                             | -20                                               |
| 4       | 26                      |                             | -21                                               |
| 5       | 18                      |                             | -29                                               |
| 6       | 23                      |                             | -24                                               |
| Evening |                         |                             |                                                   |
| 1       | 27                      | 35                          | -8                                                |
| 2       | 18                      |                             | -17                                               |
| 3       | 18                      |                             | -17                                               |
| 4       | 18                      |                             | -17                                               |
| 5       | 14                      |                             | -21                                               |
| 6       | 16                      |                             | -19                                               |

| NSR           | Rating Sound Level (dB) | Background Sound Level (dB) | Excess of Rating over Background Sound Level (dB) |
|---------------|-------------------------|-----------------------------|---------------------------------------------------|
| Night         |                         |                             |                                                   |
| 1             | 28                      | 34                          | -6                                                |
| 2             | 21                      |                             | -13                                               |
| 3             | 21                      |                             | -13                                               |
| 4             | 21                      |                             | -13                                               |
| 5             | 17                      |                             | -17                                               |
| 6             | 16                      |                             | -18                                               |
| Early Morning |                         |                             |                                                   |
| 1             | 28                      | 44                          | -16                                               |
| 2             | 21                      |                             | -23                                               |
| 3             | 21                      |                             | -23                                               |
| 4             | 21                      |                             | -23                                               |
| 5             | 17                      |                             | -27                                               |
| 6             | 16                      |                             | --28                                              |

The results in Table 12 identify that a **Low Impact** would arise from the Proposed Development in its proposed form, during typical, worst-case operations, during the daytime or evening.

### 6.3.5. Effect on the Ambient Sound Environment

The differential between the predicted specific noise levels at each residential receptor, when compared to the measured ambient  $L_{Aeq,T}$  levels in the area would ensure that no significant increase in the prevailing ambient sound level would occur during the day or evening.

### 6.3.6. Discussion

The assessment identifies that probable noise emissions from activities associated with the Site would likely give rise to low levels of audibility at the closest residential properties during the proposed operational period of the site.

The activities at the site comprise of storage, which, by its nature is intrinsically quiet, as, for the majority of the time, the stored items are static. Consequently, the only activities likely to give rise to any noise are vehicle movements, and potential maintenance; neither of which have been observed to be intensive or acoustically significant.

Given the commercial nature of the area, it is suggested that a storage use at this location, which does sit in close proximity to some of the dwellings on Baldwins Crescent, is the most acoustically benign use that could reasonably be expected in this area.

It is understood that some residents of Baldwins Crescent have raised objections to this use, but it is suggested that noise is not a sustainable reason for these objections given the use of the site.

## 7. CONCLUSION

inacoustic has been commissioned to assess the impact of potential noise arising from a commercial development on land off Trojan Close, Crymlyn Burrows, Skewen, Swansea SA1 8QA.

This technical noise assessment has been produced to accompany a Planning Application to Neath Port Talbot County Borough Council and is based upon environmental noise measurements undertaken at the site and a subsequent 3-dimensional noise modelling exercise.

The assessment considers the potential noise emissions arising from assumed peak activity at the Proposed Development, during the day, evening, night and early morning.

The assessment has identified that noise levels arising as a result of probable operations are predicted to be at a level considered to represent a *Low Impact* at the closest off-site noise-sensitive receptors, in BS4142:2014+A1:2019 terms.

In light of the above, it is considered that the potential noise impacts associated with the Proposed Development can be adequately controlled through the nature of the site operations and, where necessary, the application of suitably worded planning conditions. On this basis, noise should not be considered a material constraint to the granting of planning permission for the proposals.

## 8. APPENDICES

## 8.1. Appendix A – Definition of Terms

|                                    |                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sound Pressure                     | Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.                                                                                                                                                                                                                                                                               |
| Sound Pressure Level (Sound Level) | The sound level is the sound pressure relative to a standard reference pressure of 20µPa (20x10 <sup>-6</sup> Pascals) on a decibel scale.                                                                                                                                                                                                                                 |
| Decibel (dB)                       | A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by $20 \log_{10} (s1 / s2)$ . The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20µPa. |
| A-weighting, dB(A)                 | The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.                                                                                                                                                                                                                       |
| Noise Level Indices                | Noise levels usually fluctuate over time, so it is often necessary to consider an average or statistical noise level. This can be done in several ways, so a number of different noise indices have been defined, according to how the averaging or statistics are carried out.                                                                                            |
| $L_{eq,T}$                         | A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.                                                                                                                     |
| $L_{max,T}$                        | A noise level index defined as the maximum noise level during the period T. $L_{max}$ is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall $L_{eq}$ noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.                |
| $L_{90,T}$                         | A noise level index. The noise level exceeded for 90% of the time over the period T. $L_{90}$ can be considered to be the "average minimum" noise level and is often used to describe the background noise.                                                                                                                                                                |
| $L_{10,T}$                         | A noise level index. The noise level exceeded for 10% of the time over the period T. $L_{10}$ can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise.                                                                                                                                                                    |
| Free-Field                         | Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m                                                                                                                                                                                                                                                                 |
| Facade                             | At a distance of 1m in front of a large sound reflecting object such as a building façade.                                                                                                                                                                                                                                                                                 |
| Fast Time Weighting                | An averaging time used in sound level meters. Defined in BS 5969.                                                                                                                                                                                                                                                                                                          |

In order to assist the understanding of acoustic terminology and the relative change in noise, the following background information is provided.

The human ear can detect a very wide range of pressure fluctuations, which are perceived as sound. In order to express these fluctuations in a manageable way, a logarithmic scale called the decibel, or dB scale is used. The decibel scale typically ranges from 0 dB (the threshold of hearing) to over 120 dB. An indication of the range of sound levels commonly found in the environment is given in the following table.

TABLE 13: TYPICAL SOUND LEVELS FOUND IN THE ENVIRONMENT

| Sound Level     | Location                   |
|-----------------|----------------------------|
| 0dB(A)          | Threshold of hearing       |
| 20 to 30dB(A)   | Quiet bedroom at night     |
| 30 to 40dB(A)   | Living room during the day |
| 40 to 50dB(A)   | Typical office             |
| 50 to 60dB(A)   | Inside a car               |
| 60 to 70dB(A)   | Typical high street        |
| 70 to 90dB(A)   | Inside factory             |
| 100 to 110dB(A) | Burglar alarm at 1m away   |
| 110 to 130dB(A) | Jet aircraft on take off   |
| 140dB(A)        | Threshold of Pain          |

The ear is less sensitive to some frequencies than to others. The A-weighting scale is used to approximate the frequency response of the ear. Levels weighted using this scale are commonly identified by the notation dB(A).

In accordance with logarithmic addition, combining two sources with equal noise levels would result in an increase of 3 dB(A) in the noise level from a single source.

A change of 3 dB(A) is generally regarded as the smallest change in broadband continuous noise which the human ear can detect (although in certain controlled circumstances a change of 1 dB(A) is just perceptible). Therefore, a 2 dB(A) increase would not be normally be perceptible. A 10 dB(A) increase in noise represents a subjective doubling of loudness.

A noise impact on a community is deemed to occur when a new noise is introduced that is out of character with the area, or when a significant increase above the pre-existing ambient noise level occurs.

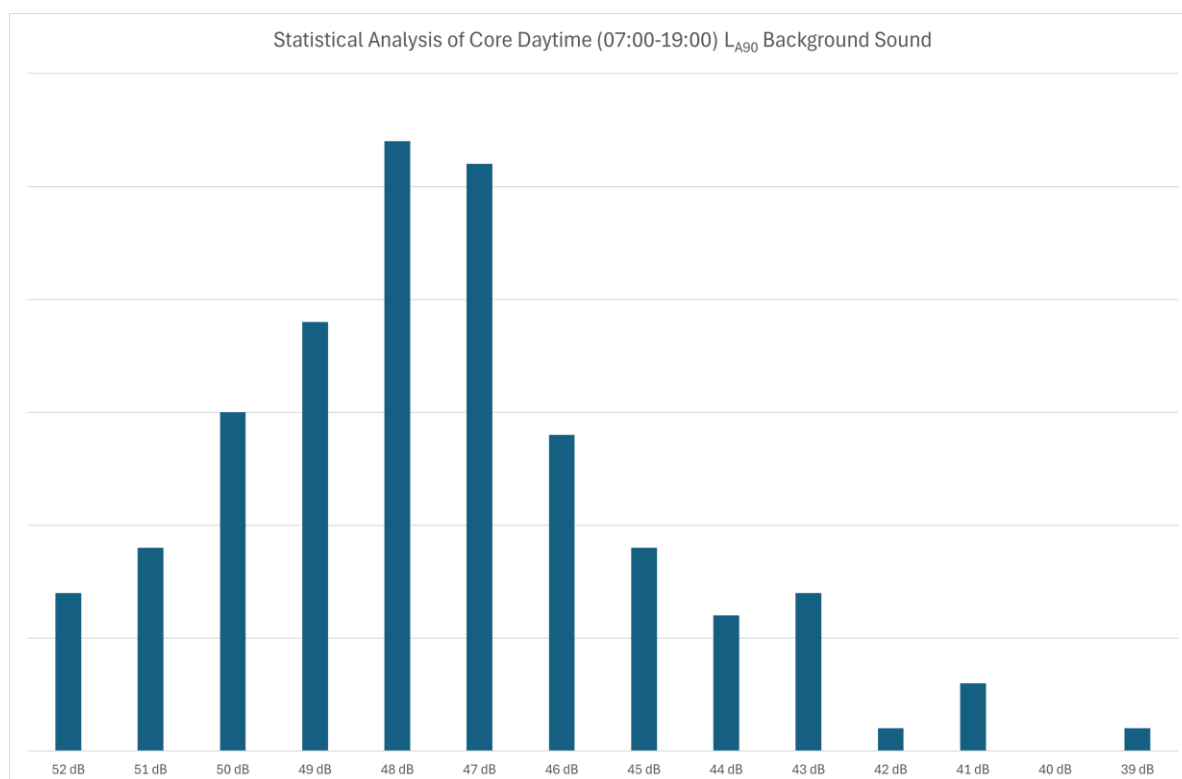
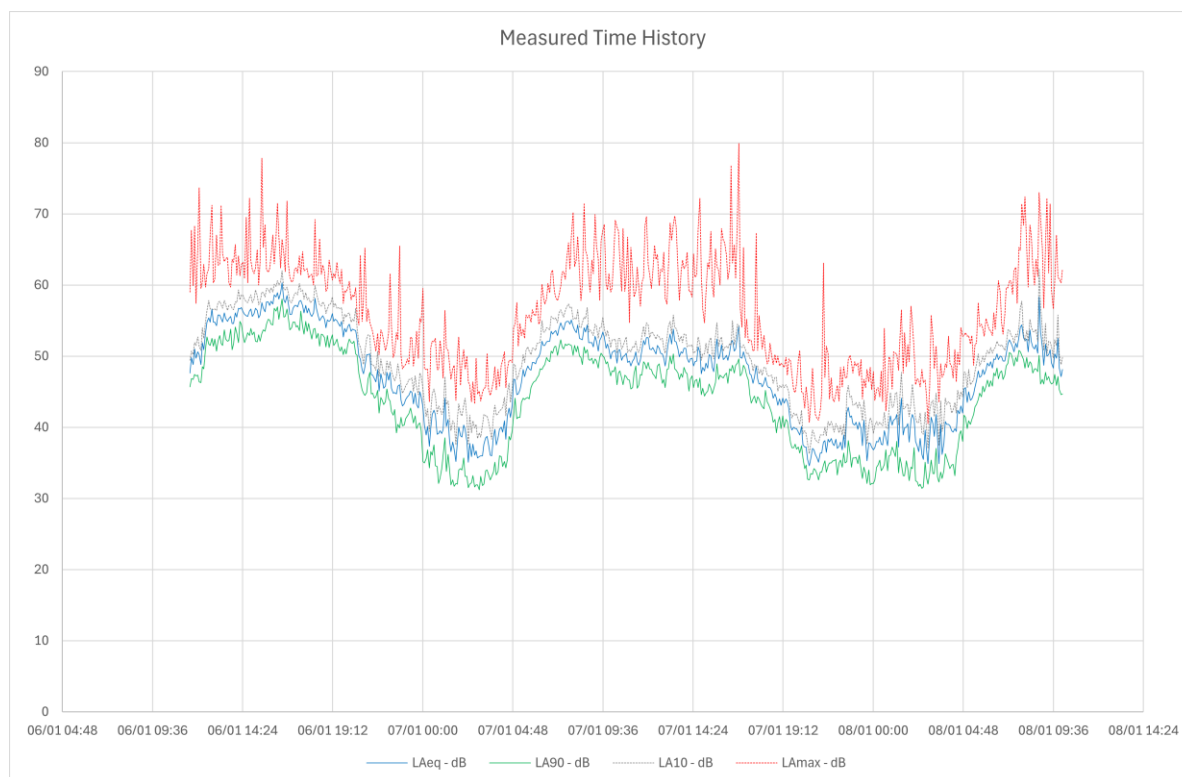
For levels of noise that vary with time, it is necessary to employ a statistical index that allows for this variation. These statistical indices are expressed as the sound level that is exceeded for a percentage of the time period of interest. In the UK, traffic noise is measured as the  $L_{A10}$ , the noise level exceeded for 10% of the measurement period. The  $L_{A90}$  is the level exceeded for 90% of the time and has been adopted to represent the background noise level in the absence of discrete events. An alternative way of assessing the time varying noise levels is to use the equivalent continuous sound level,  $L_{Aeq}$ .

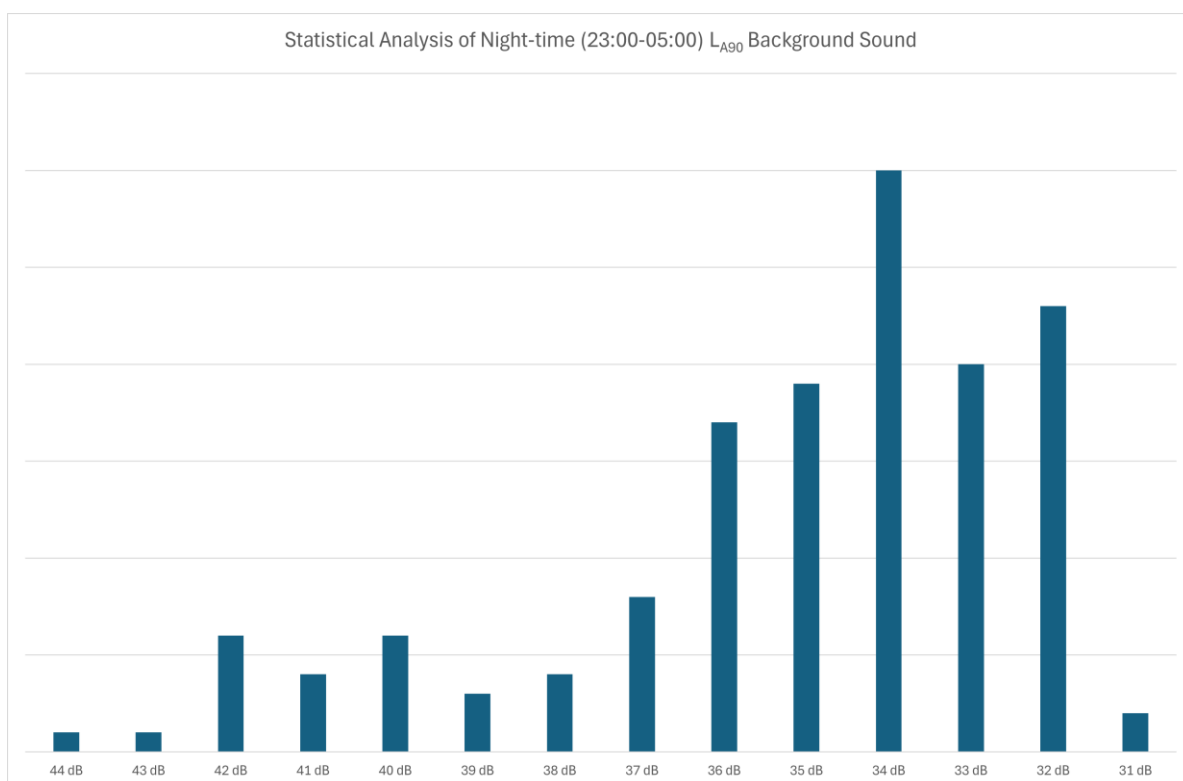
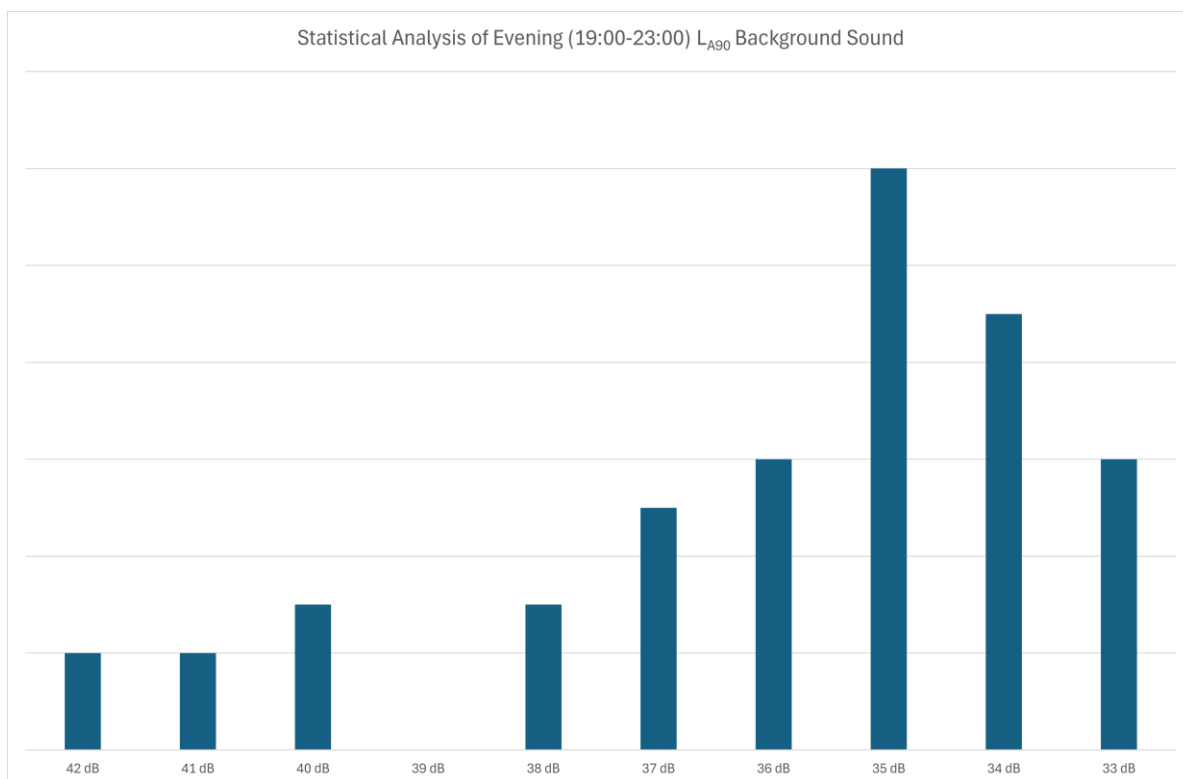
This is a notional steady level that would, over a given period of time, deliver the same sound energy as the actual fluctuating sound.

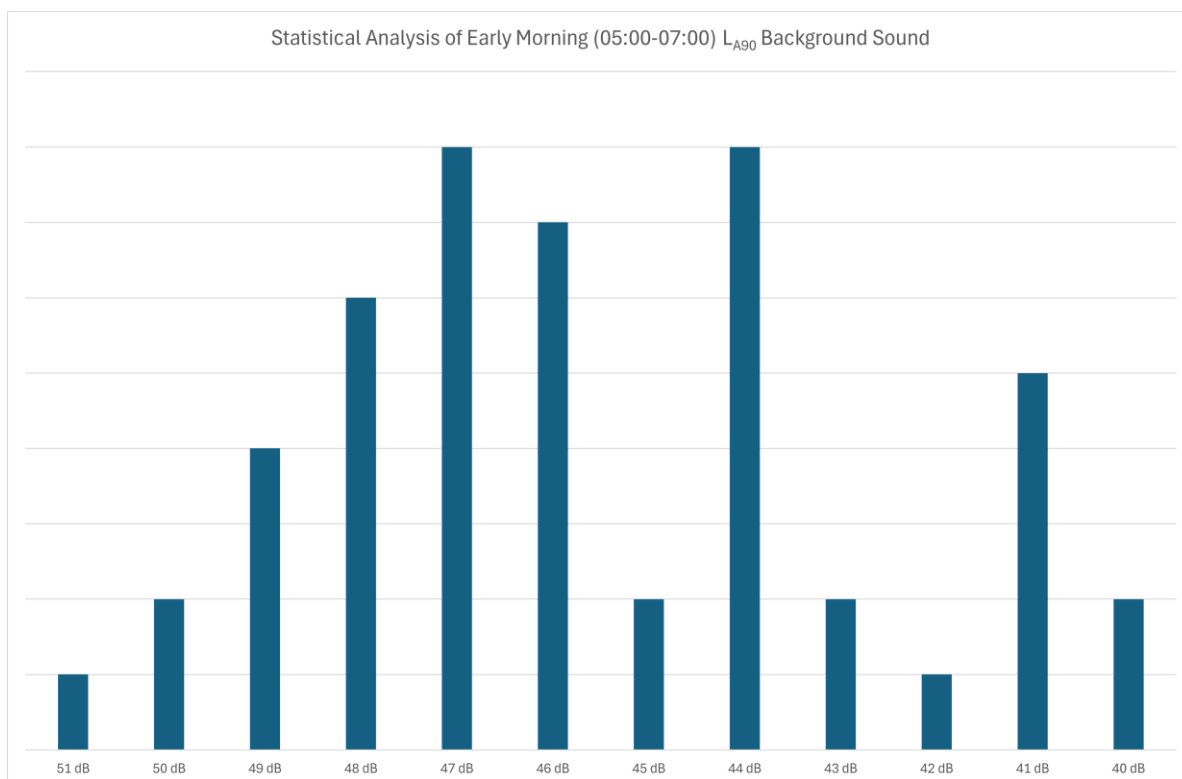
To put these quantities into context, where a receiver is predominantly affected by continuous flows of road traffic, a doubling or halving of the flows would result in a just perceptible change of 3 dB, while an increase of more than 25%, or a decrease of more than 20%, in traffic flows represent changes of 1 dB in traffic noise levels (assuming no alteration in the mix of traffic or flow speeds).

Note that the time constant and the period of the noise measurement should be specified. For example, BS 4142 specifies background noise measurement periods of 1 hour during the day and 15 minutes during the night. The noise levels are commonly symbolised as  $L_{A90,1\text{hour}}$  dB and  $L_{A90,15\text{mins}}$  dB. The noise measurement should be recorded using a 'FAST' time response equivalent to 0.125 ms.

## 8.2. Appendix B – Full Measurement Results







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