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# Proposed New-build Car Valet Centre, 7-9 Pinder Oaks Street, Barnsley, S70 1XR

# Noise Impact Assessment

**For:**
**Garry Greetham Associates**

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# Contents

# 1 Introduction

## 1.1 Overview

Environmental Noise Solutions Ltd (ENS) has been commissioned by Garry Greetham Associates (hereafter referred to as 'the client') to undertake a noise impact assessment in support of a planning application for a new Valet Centre at 7-9 Pinder Oaks Street, Barnsley, S70 1XR (hereafter referred to as 'the site').

This report details:

- The methodology and results of a noise survey conducted at the site
- The assessment of potential impact of fixed plant items on nearby noise sensitive receptors

The report has been prepared on behalf of the client for the sole purpose described above and no extended duty of care to any third party is implied or offered. Third parties referring to the report should consult the client and ENS as to the extent to which the findings may be appropriate for their use.

A glossary of acoustic terms used in the main body of the text is contained in Appendix A.

## 1.2 Site Description

The site is located off Tune Street in Barnsley, centred on grid reference: 435164,405666 in a predominantly urban setting. The application site comprises derelict dwellings at No. 7 and No. 9 Tune Street which are proposed to be demolished.

Figure 1.1 below indicates the approximate site boundary and surrounding properties.

**Figure 1.1:** Location of Proposed Development


The site is bounded to the north by Malcolms Tyre and Exhaust Centre, Tune Street to the south, Pinder Oaks Street the east and existing residential dwellings to the west.

## 1.3 Site Activities and Plant

Development proposals are for the construction of a new car valet building, featuring a single roller shutter door opening on to Tune Street. All activities will be undertaken internally, including pressure washing, buffing, polishing and the occasional wheel removal for the cleaning of wheel hubs and alloys. It should be noted that the removal of wheel nuts will be achieved with hand-held battery-operated guns, which are typically less noisy than air powered tools.

The proposed valet bays will operate between the hours 08:30 – 17:30 Monday to Friday and 08:30 – 12:00 on Saturdays.

During peak periods, up to two cars may be washed simultaneously using the jet wash equipment, followed by either valeting (including use of vacuum cleaners), or hand drying.

## 1.4 Noise Sensitive Receptors

The closest noise sensitive receptors to the proposed development are described in Table 1.1 below, and indicated on the site plan presented as Appendix B.

**Table 1.1: Noise Sensitive Receptors**

| NSR | Description | Approximate distance from site boundary (m) |
|---|---|---|
| A | 47-53 Tune Street, Barnsley | 18 |

# 2 Noise Criteria

## British Standard 4142: 2014 +A1:2019 "Methods for rating and assessing industrial and commercial sound"

BS 4142[1] presents methods for rating and assessing the potential impact of commercial and industrial sound upon noise sensitive receptors. The Standard is appropriate for the consideration of industrial and manufacturing processes, fixed installations which comprise mechanical and electrical plant and equipment and mobile plant / vehicles that form an intrinsic part of the industrial/commercial including the loading and unloading of goods and materials at the premises.

The noise impact magnitude is derived from the numerical subtraction of the representative[2] background noise level from the measured or calculated rating level of the specific sound under consideration. Typically, the greater this difference, the greater the magnitude of the impact:

- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context
- A difference of around +5 dB 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 'rating level' must be determined considering the need for any 'character corrections' to the specific industrial/commercial noise level to account for tonal qualities, impulsive qualities, other sound characteristics and/or intermittency. This can be done using a subjective, objective or reference methods. Where multiple features are present the corrections should be added in a linear fashion to the specific level.

The subjective method is based on the corrections presented in Table 2.1.

**Table 2.1: BS4142 Subjective Method 'Acoustic Feature' / Rating Corrections**

| Level of Perceptibility | Tonal Correction | Impulsivity Correction | Intermittency Correction | Other |
|---|---|---|---|---|
| None | 0 dB | 0 dB | +3 dB Where intermittency is readily identifiable | +3 dB Where neither tonal nor impulsive but clearly identifiable against prevailing soundscape |
| Just Perceptible | + 2 dB | + 3 dB | | |
| Clearly Perceptible | + 4 dB | + 6 dB | | |
| Highly Perceptible | + 6 dB | + 9 dB | | |

BS 4142 requires separate analysis for day and night time periods, evaluating the Rating level over an appropriate reference time interval ($T_r$) of:

- 1 hr during the day (between 07:00 - 23:00 hrs)
- 15 min during the night (between 23:00 - 07:00 hrs)

[1] British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound. British Standards Institution (2019)

[2] 'Representative' is generally considered to be 'typical' (e.g. formed by analysis of modal / mean average values) rather than the lowest measured

# 3 Noise Survey and Results

## 3.1 Overview

In order to assess the existing background noise levels at the nearest NSR, a baseline noise survey was undertaken during the daytime in the vicinity of the nearest noise sensitive receptor on Wednesday 9th August 2023.

A single monitoring position (MP1) was adopted to the south of the proposed valet centre, in the vicinity of the nearest receptor (the approximate locations are identified on an annotated plan in Appendix B). Noise measurements were undertaken using Bruel & Kjaer 2250 Type 1 integrating sound level meters. The sound level meter was connected to a windshield covered microphone at approximately 1.5m above ground level.

The calibration of the measurement system was verified immediately before and after the survey period using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration levels greater than 0.5 dB was noted.

Measurements consisted of A–weighted broadband parameters including $L_{Aeq}$, $L_{A10}$, $L_{A90}$ and $L_{AFmax}$ together with linear 1/3$^{rd}$ octave band data.

Weather conditions were considered appropriate for noise monitoring throughout the survey period.

## 3.2 Summary of Results

Table 3.1 presents a summary of the noise data for each measurement session, at each measurement position, rounded to the nearest decibel.

**Table 3.1: Summary of Noise Measurement Data**

| Position | Date | Time (hh:mm) | $L_{Aeq,T}$ (dB) | $L_{AFmax}$ (dB) | $L_{A10,T}$ (dB) | $L_{A90,T}$ (dB) | Comment |
|---|---|---|---|---|---|---|---|
| 1 | 09/08/2023 | 09:34-09:49 | 54 | 83 | 55 | 44 | Noise climate controlled by local and distant road traffic |
| | | 09:49-10:04 | 59 | 81 | 60 | 45 | |
| | | 10:04-10:19 | 60 | 92 | 59 | 45 | |
| | | 10:19-10:34 | 56 | 76 | 57 | 46 | |
| | | 10:34-10:49 | 56 | 76 | 59 | 44 | |
| | | 10:49-11:04 | 55 | 75 | 57 | 45 | |
| | | 11:04-11:19 | 56 | 75 | 58 | 46 | |
| | | 11:19-11:34 | 56 | 75 | 57 | 42 | |
| | | 11:34-11:49 | 58 | 78 | 59 | 44 | |
| | | 11:49-12:04 | 58 | 79 | 58 | 43 | |
| | | 12:04-12:19 | 58 | 83 | 59 | 42 | |
| | | 12:19-12:34 | 63 | 92 | 58 | 43 | |

The ambient noise climate at the application site was characterised by road traffic on Tune Street and Pinder Oaks Street, and the wider road network.

# 4 Fixed Plant Assessment

## 4.1 Fixed Plant Items

Measurements have previously been undertaken by ENS of a similar external jet-washing process on Wednesday 22nd December 2021. Noise emissions were primarily associated with the high-pressure jet and were measured at 74 dB $L_{Aeq,T}$ at 2 metres distance externally (free field conditions) Additional measurements were made of an industrial vacuum cleaner which measured 71 dB at 2 metres distance (free field).

These noise levels have been used to derive a reverberant internal noise level ($SPL_{REV}$) based on the following calculation:

$$SPL_{REV} = SWL + 10 \times \log(\frac{RT}{V}) + 14$$

Where:

RT = the reverberation time (s) within the building (1 second assumed)

V = volume of the space ($m^3$), estimated to be 1134$m^3$

The reverberant sound pressure level is calculated as 73 dB $SPL_{REV}$.

## 4.2 Assessment

To calculate noise levels at the closest noise sensitive receptors, a three-dimensional noise model has been developed. Noise model geometry is based on Ordnance Survey mapping data and information supplied by the client.

Noise emission from the valet centre roller shutter doors been calculated according to ISO 9613: 1996 assuming that the roller shutter doors are open for a total of 15 minutes in any 1-hour period, with an area of 11$m^2$ and an overall height of 2.4m when open. All plant is assumed to be operating continuously and concurrently throughout the assessment period.

Noise levels at the façade of the closest noise sensitive receptor have been calculated at a height of 4m above ground level, representative of a first-floor bedroom.

The results are presented in Table 4.1 below.

**Table 4.1: Specific Noise Level**

| NSR | Predicted specific noise level (dB $L_{Aeq,1hr}$) |
|---|---|
| A | 40 |

With regard to potential 'acoustic feature' corrections, the following is considered:

- Whilst it is possible that some processes would be intermittent, the assessment assumes that all items of plant are operating continuously and concurrently throughout the assessment period therefore no correction has been applied for intermittency.
- Plant of this type is not generally tonal, and the specific noise level at the receiver does not exceed the representative background level. On this basis, it is considered unlikely that tonality would be perceptible at the nearest NSR.
- Noise associated with the type of plant used on site is not impulsive in nature; therefore, a correction for impulsivity has not been applied.

The calculated plant noise levels have been assessed in accordance with BS 4142.

Representative background noise levels are derived from the arithmetic average of the 15-minute background noise levels presented in Table 3.1.

The results of the assessment are presented in Table 4.1.

**Table 4.1: Fixed Plant Noise Assessment – Daytime (07:00-23:00)**

| Parameter | NSR A |
|---|---|
| Typical background sound level (dB $L_{A90,1hour)}$ | 42 |
| Specific noise level (dB $L_{Aeq,1hr)}$<br>(See Section 4.1 – plant assumed to operate continuously for 100% of assessment period) | 40 |
| BS 4142 Acoustic feature correction (dB) | 0 |
| Rating noise level (dB $L_{Ar,1hour}$) | 40 |
| Excess over background sound level | -2 |

The assessment presented in table 4.3 indicates that the rating noise level from fixed plant would not exceed the representative background noise level.

With reference to the BS 4142 guidance set out in Section 2, where the rating noise level from an item or items of fixed plant does not exceed the representative background noise level by this is an indication of a 'low impact'.

# 5 Summary and Conclusions

A noise impact assessment has been performed in support of a planning application for a new Car Valet Centre, 7-9 Pinder Oaks Street, Barnsley, S70 1XR.

Noise monitoring was undertaken on Wednesday 9th August 2023 to assess noise levels in the vicinity of the site and at locations representative of the nearest noise sensitive receptors.

Noise emission from all items of fixed plant associated with the development has been assessed having regard to the guidance set out in BS 4142 summarised in Section 2, and the results of the noise survey summarised in Section 3 of this report.

The assessment indicates that noise emission from all items of fixed plant operating concurrently would not exceed the prevailing background noise level at the façade of the closest noise sensitive receptors.

Such a noise level is indicative of a 'low impact' according to the guidance set out in BS 4142, therefore the proposals are considered suitable without mitigation.

# Appendix A – Abbreviations and Definitions

**Sound Pressure Level ($L_p$)**
The basic unit of sound measurement is the sound pressure level. As the pressures to which the human ear responds can range from 20 μPa to 200 Pa, a linear measurement of sound levels would involve many orders of magnitude. Consequently, the pressures are converted to a logarithmic scale and expressed in decibels (dB) as follows:

$L_p = 20 \log_{10}(p/p_o)$

Where $L_p$ = sound pressure level in dB; p = rms sound pressure in Pa; and $p_o$ = reference sound pressure (20 μPa).

**A-weighting**
A frequency filtering system in a sound level meter, which approximates under defined conditions the frequency response of the human ear. The A-weighted sound pressure level, expressed in dB(A), has been shown to correlate well with subjective response to noise.

**Equivalent continuous A-weighted sound pressure level, $L_{Aeq,\,T}$**
The value of the A-weighted sound pressure level in decibels of continuous steady sound that within a specified time interval, *T*, has the same mean-square sound pressure as a sound that varies with time. $L_{Aeq,\,16h}$ (07:00 to 23:00 hours) and $L_{Aeq,\,8h}$ (23:00 to 07:00 hours) are used to qualify daytime and night time noise levels.

***$L_{A10,\,T}$***
The A-weighted sound pressure level in decibels exceeded for 10% of the measurement period, T. $L_{A10,\,18h}$ is the arithmetic mean of the 18 hourly values from 06:00 to 24:00 hours.

***$L_{A90,\,T}$***
The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval, T. $L_{A90}$ is typically taken as representative of background noise.

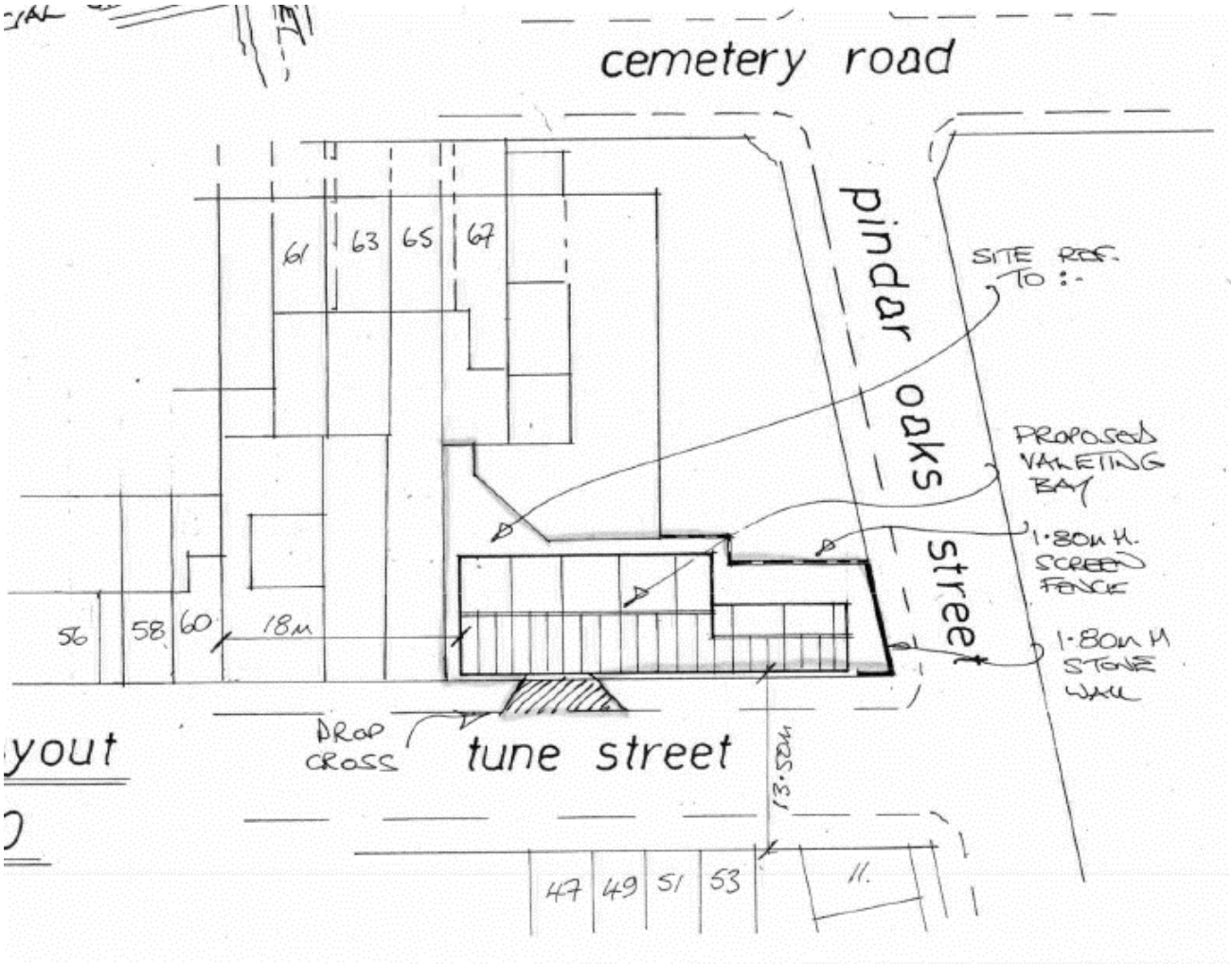
***$L_{AF\,max}$***
The maximum A-weighted noise level recorded during the measurement period. The subscript 'F' denotes fast time weighting, slow time weighting 'S' is also used.

**Single Event Level / Sound Exposure Level (SEL or $L_{AE}$)**
The energy produced by a discrete noise event averaged over one second, regardless of the event duration. This allows for comparison between different noise events which occur over different lengths of time.

**Weighted Sound Reduction Index ($R_W$)**
Single number quantity which characterises the airborne sound insulation properties of a material or building element over a defined range of frequencies ($R_W$ is used to characterise the insulation of a material or product that has been measured in a laboratory).

# Appendix B – Measurement Positions

# Appendix C – Site Plan



# Appendix D – CadnaA Noise Modelling