Environmental Noise Solutions Limited

Suite 24
Doncaster Business Innovation Centre
Ten Pound Walk
Doncaster
DN4 5HX

Proposed Residential Conversion
2 Bridge Street, Batley, WF17 5NU

Noise Impact Assessment

For:
Savile Enterprise Ltd

9th July 2026

Ref: NIA-12569-26-12569-v3 2 Bridge Street, Batley

Author: T. Swallow BSc(hons), AMIOA

Contents

1 Introduction

1.1 Overview

Environmental Noise Solutions (ENS) has been commissioned by Savile Enterprise Ltd to carry out a noise impact assessment for the proposed residential conversion of 2 Bridge Street, Batley, WF17 5NU (hereafter referred to as 'the site').

Proposals are for the building to be converted to 8no. residential apartments. This report is prepared to support planning applications ref: 2025/93525 (covering the ground floor) and 2025/93526 (covering the first floor).

It is understood that the following draft condition has been presented by Kirklees Council:

1. *Before construction work commences, a report specifying the measures to be taken to protect the development from noise from all significant noise sources that are likely to affect the proposed development shall be submitted to and approved in writing by the Local Planning Authority. The report shall:*

   - *Determine the existing noise climate*
   - *Predict the noise climate in living rooms (daytime), bedrooms (night-time) and other habitable rooms of the development*
   - *Detail the proposed attenuation/design necessary to protect the amenity of the occupants of the new residences (including ventilation if required)*

   The development shall not be occupied until all works specified in the approved report have been carried out in full and such works shall be thereafter retained.

   Reason: To protect the amenity of occupiers of the proposed development from noise or disturbance from nearby noise generating premise to accord with the aims of Policies LP24 and LP25 of the Kirklees Local Plan and Chapters 12 and 15 of the National Planning Policy Framework. This is a pre-commencement condition to ensure that the proposal would provide an acceptable standard of living for the future occupiers of the site.

The objectives of the noise impact assessment were therefore to:

- Determine external noise levels at the site
- Assess the potential impact of the external noise climate on the proposed residential development with reference to relevant guidelines
- Provide recommendations for a scheme of sound attenuation works, as necessary, to provide residential amenity for future occupants

This report details the methodology and results of the assessment and provides recommendations for the building envelope (glazing, fenestration and ventilation).

The report has been prepared for Savile Enterprise Ltd 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 Savile Enterprise Ltd 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 1.

1.2 Site Description and Proposed Development

The site is located in mixed-use residential/commercial area of Batley, sitting to the west of Bridge Street, as shown (highlighted in red) in Figure 1.1.

Figure 1.1: Location of Development

The site is bound by:

- Residential dwellings to the north along Bridge Street
- Bridge Street to the east with commercial units opposite
- BP petrol filling station and Spar convenience store to the south, with Bradford Road beyond
- Park Road Junior, Infant & Nursery School to the west with residential beyond

The noise environment across the site is characterised by road traffic on Bridge Street and Bradford Road. No significant noise associated with the nearby commercial units were noted.

Development proposals are for the change of use of ground and first floor to create a total of 8 no. 1-bedroom apartments.

2 Assessment Guidance

2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF)[1] was updated in February 2025 and sets out the Government's planning policies for England and how these are expected to be applied.

Where issues of noise impact are concerned the NPPF provides brief guidance in paragraph 187 where it states that planning policies and decisions should contribute to and enhance the natural and local environment by:

'preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of…..noise pollution'.

Paragraph 198 advises that:

'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should…..mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life'.

The NPPF also refers to the 2010 DEFRA publication, the Noise Policy Statement for England (NPSE) which reinforces and supplements the NPPF.

2.2 Noise Policy Statement for England

The Noise Policy Statement for England[2] (NPSE) sets out the long-term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development. This long-term vision 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
- Where possible, contribute to the improvement of health and quality of life

The NPSE describes the following levels at which noise impacts may be identified:

- NOEL – No Observed Effect Level. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise
- LOAEL – Lowest Observed Adverse Effect Level. This is the level above which adverse effects on health and quality of life can be detected
- SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur

According to the explanatory notes in the statement, where a noise level falls between the lowest observable adverse effect level (LOAEL) and a level which represents a significant observable adverse effect level (SOAEL):

'….all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur.'

1 National Planning Policy Framework. Ministry of Housing, Communities and Local Government (2023)
2 Government Department for Environment, Food and Rural Affairs. Noise Policy Statement for England. March 2010.

2.3 Planning Practice Guidance on Noise

Planning Practice Guidance[3] (PPG) is an online resource which provides additional guidance and elaboration on the NPPF. It advises that the Local Planning Authority should consider the acoustic environment in relation to:

- Whether or not a significant adverse effect is occurring or likely to occur
- Whether or not an adverse effect is occurring or likely to occur
- Whether or not a good standard of amenity can be achieved

In line with the Explanatory Note of the NPSE, the PPG references the LOAEL and SOAEL in relation to noise impact. It also provides examples of outcomes that could be expected for a given perception level of noise, plus actions that may be required to bring about a desired outcome. However, in line with the NPSE, no objective noise levels are provided for LOAEL or SOAEL.

The PPG also provides general advice on the typical options available for mitigating noise, suggesting that Local Plans may include noise standards applicable to proposed developments within the Local Authority's administrative boundary, although it states that:

'Care should be taken, however, to avoid these being implemented as fixed thresholds as specific circumstances may justify some variation being allowed'.

The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation. The following guidance documents provide some meaningful context.

2.4 ProPG Planning and Noise: New Residential Development

ProPG Planning and Noise: New Residential Development (ProPG)[4] was published in 2017 by the Association of Noise Consultants, Institute of Acoustics and the Chartered Institute of Environmental Health.

Stage 2: Element 2 of ProPG sets indoor ambient noise levels for residential dwellings based on the guidance contained in British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'[5] (BS 8233), see Table 2.1.

Table 2.1: Indoor Ambient Noise Levels in Dwellings

Activity	Location	Good Indoor Ambient Noise Levels	
Resting	Living Room	35 dB $L_{Aeq\ (0700\text{-}2300)}$	-
Dining	Dining Room/Area	40 dB $L_{Aeq\ (0700\text{-}2300)}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq\ (0700\text{-}2300)}$	30 dB $L_{Aeq\ (2300\text{-}0700)}$ 45 dB $L_{AMax,F\ (2300\text{-}0700)}$

Note 4 to the above table states:

'A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night.'

3 Planning Practice Guidance on Noise: http://planningguidance.planningportal.gov.uk/blog/guidance/noise/

4 'ProPG Planning and Noise: New Residential Development (ProPG)', 2017. Association of Noise Consultants (ANC), Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH)

5 British Standards Institution (2014). *British Standard 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings.*

Note 5 to the above table states:

'Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded, subject to the further advice in Note 7'.

This is consistent with the guidance contained within the PPG, which states that:

'... consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations'.

On the basis of the above, the following criteria (with windows closed and an alternative means of ventilation provided) are considered appropriate for the proposed development and considered to represent good resting and sleeping conditions:

- ≤ 35 dB $L_{Aeq\ (0700\text{-}2300)}$ in habitable rooms during the daytime
- ≤ 30 dB $L_{Aeq\ (2300\text{-}0700)}$ in bedrooms during the night-time
- 45 dB L_{AFMax} not regularly exceeded during the night-time

2.5 British Standard BS 4142:2014+A1:2019

BS 4142:2014+A1-2019 'Methods for Rating and Assessing Industrial and Commercial Sound' (BS 4142)[6] describes methods for determining, at the outside of a building, noise levels from factories or industrial premises and a method for assessing whether the noise is likely to give rise to adverse impacts, and 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. Typically, the greater this difference, the greater the magnitude of the impact. For example:

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 is described as the specific sound level (the equivalent continuous A-weighted sound pressure level at the assessment position (NSR) produced by the specific sound source over the given reference time interval) plus any adjustment for the characteristic features of the sound. The character correction relates to whether and to what degree the specific sound is assessed to have an element of tonality, impulsivity and/or characteristics that are readily distinctive against the residual acoustic environment.

6 British Standard 4142:2014+A1-2019 Methods for rating and assessing industrial and commercial sound, BSI (2014)

The background noise level is the A–weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 percent of a given time interval, T, measured using time weighting 'F' and quoted to the nearest whole number of decibels.

The reference time interval of the specific sound is 1 hour during the daytime and 15 minutes during the night-time.

3 Noise Survey

3.1 Overview

In order to determine the level of external noise affecting the proposed development, noise monitoring was carried out on Tuesday 10th March 2026 through to Wednesday 11th March 2026.

The adopted noise monitoring positions (shown in Appendix 2) were as follows:

- MP1 was located on the eastern elevation of the building, overlooking Bridge Street
- MP2 was located on the south western elevation of the building

Noise measurements were undertaken at first floor level and at 1 metre from the existing building façade using NTi XL3 Type 1 integrating sound level meters. Each meter was connected to a windshield covered microphone positioned at the locations detailed above.

The measurement system calibration was verified immediately before and after the survey period using a Bruel & Kjaer Type 4231 calibrator. No drift in calibration level was noted.

Measurements consisted of A–weighted broadband parameters including L_{Aeq}, L_{A10} L_{A90}, and L_{AFMax} together with linear octave band data.

The noted weather conditions during the survey were mostly dry with wind speeds < 5 m/s. Weather conditions were therefore considered appropriate for noise monitoring.

3.2 Summary

Table 3.1 presents a summary of the noise data for each measurement session, at each measurement position, rounded to the nearest decibel. As measurements were made at 1 metre from the existing building façade, a –3 dB façade enhancement correction has been applied to the measured levels in order to establish the free field levels.

Table 3.1: Summary of Noise Measurement Data

Position	Date	Time	L_{Aeq} (dB)	L_{A90} (dB)	L_{A10} (dB)	L_{AFMax} (dB)	Comment
MP1	10/3/26	1042-2300	57	48	62	-	Road traffic on Bridge Street and Bradford Road dominant
	11/3/26	0700-1016	58	50	64	-	
	10-11/3/26	2300-0700	49	38	52	71*	
MP2	10/3/26	1107-2300	58	53	60	-	Road traffic on Bradford Road and Bridge Street dominant
	11/3/26	0700-1019	58	54	61	-	
	10-11/3/26	2300-0700	52	45	58	71*	
** 11th highest maximum noise level event during the night-time*							

The ambient noise environment at the site was controlled by road traffic on Bridge Street and Bradford Road, and noise from the PFS was not considered to be significant.

Daytime and night-time ambient noise levels at MP1 were measured at **57 dB $L_{Aeq\ (0700–2300)}$** and **49 dB $L_{Aeq\ (2300–0700)}$** respectively. Typical (11th highest) maximum noise levels at MP1 were measured at **71 dB L_{AFMax}** during the night-time.

Daytime and night-time ambient noise levels at MP2 were measured at **58 dB $L_{Aeq\ (0700–2300)}$** and **52 dB $L_{Aeq\ (2300–0700)}$** respectively. Typical (11th highest) maximum noise levels at MP1 were measured at **71 dB L_{AFMax}** during the night-time.

The typical $L_{A90,15min}$ values at MP2 during the daytime and night-time were **54 dB $L_{A90\ (15\ min)}$** and **45 dB $L_{A90\ (15\ min)}$,** respectively. These values have been derived by selecting the modal $L_{A90,15min}$ during the relevant period, in accordance with BS 4142:2014.

4 Noise Assessment

4.1 Overview

Noise levels overlooking Bridge Street (east and north elevations) are as follows;

- **≤ 57 dB $L_{Aeq\ (0700\text{-}2300)}$** during the daytime
- **≤ 49 dB $L_{Aeq\ (2300\text{-}0700)}$** during the night-time
- **≤ 71 dB L_{AFMax}** during the night-time

Noise levels overlooking Bradford Road (southern elevation) are as follows;

- **≤ 58 dB $L_{Aeq\ (0700\text{-}2300)}$** during the daytime
- **≤ 52 dB $L_{Aeq\ (2300\text{-}0700)}$** during the night-time
- **≤ 71 dB L_{AFMax}** during the night-time

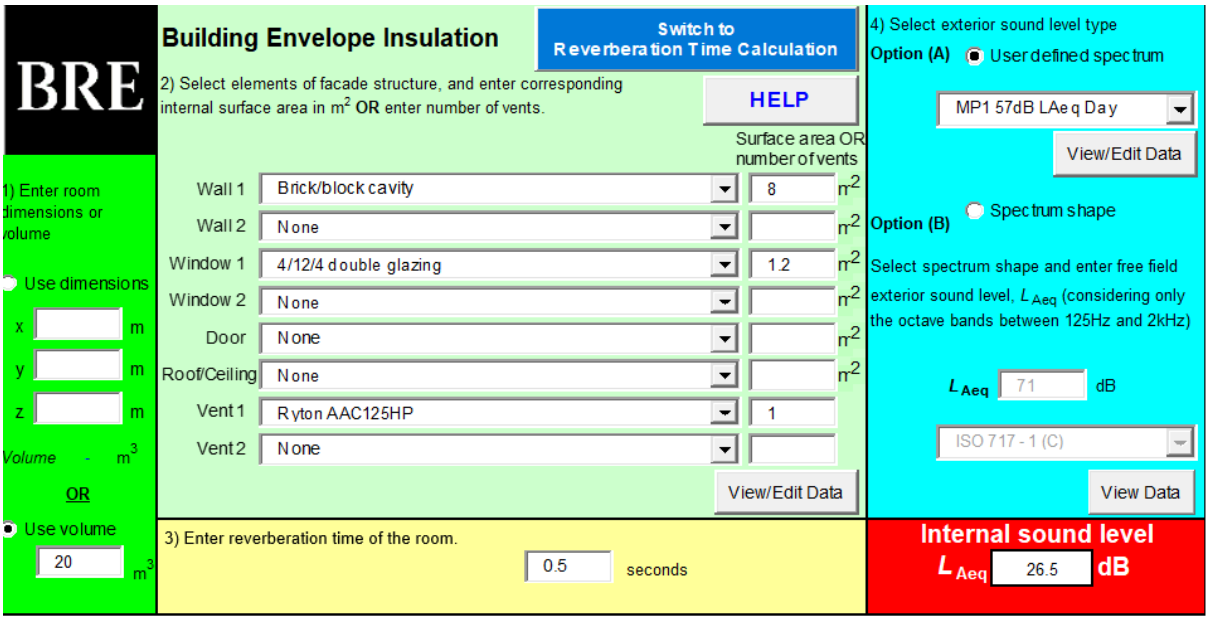
4.2 Scheme of Sound Attenuation

In order to calculate the sound insulation requirements of the building envelope for habitable rooms throughout the development, the Building Research Establishment (BRE) building envelope insulation calculation spreadsheet was used. This spreadsheet is based on the calculation methodology advocated in BS 8233. The spreadsheet allows input of external noise levels, typical room dimensions and reverberation time together with parameters for the various elements of the building envelope and calculates the internal noise level in terms of the external noise level metric (L_{Aeq} and L_{AFMax} in this case).

It is understood that the development is to be provided with a decentralised mechanical extract ventilation (dMEV) system using continuously-running kitchen/bathroom extracts on a 'trickle' rate in conjunction trickle vents/through-wall vents in habitable rooms.

Habitable rooms throughout the site should be provided with standard glazing rated at least **25 dB R_w+C_{tr}**, such as 4 mm glass / 6-20 mm cavity / 4 mm glass, in conjunction with acoustic wall vents rated at least **41 dB $D_{n,e,w}+C_{tr}$**, such as the Ryton AAC125HP (1no. per habitable room) as part of the MEV system. As evidenced in the Building Research Establishment (BRE) building envelope insulation calculation spreadsheet below, the glazing/ventilation specification will provide circa 30 dB reduction of external noise levels.

Figure 4.1: Example BRE Calculation Spreadsheet (Bridge Street - Daytime)



The resultant internal noise levels are set out in the table below.

Table 4.1 – External Noise Levels and Resultant Internal Noise Levels

Location	External Noise Level	Reduction	Resultant Internal Level
Bridge Road Elevations	≤ 57 dB $L_{Aeq\ (0700\text{-}2300)}$ ≤ 49 dB $L_{Aeq\ (2300\text{-}0700)}$ ≤ 71 dB L_{AFMax}	–30 dB	≤ 27 dB $L_{Aeq\ (0700\text{-}2300)}$ ≤ 19 dB $L_{Aeq\ (2300\text{-}0700)}$ ≤ 41 dB L_{AFMax}
Bradford Road Elevations	≤ 58 dB $L_{Aeq\ (0700\text{-}2300)}$ ≤ 52 dB $L_{Aeq\ (2300\text{-}0700)}$ ≤ 71 dB L_{AFMax}	–30 dB	≤ 28 dB $L_{Aeq\ (0700\text{-}2300)}$ ≤ 22 dB $L_{Aeq\ (2300\text{-}0700)}$ ≤ 41 dB L_{AFMax}

On the basis of the above, the proposed glazing and ventilation specification is appropriate for all habitable rooms at the site.

Points to Note

The following points should be noted:

- The glazing recommendations apply to the window within a sealed unit. It is the responsibility of the window supplier to ensure that the window frame does not compromise the performance of the glazing.

- When selecting a glazing system to satisfy the requirements outlined above, it is important to ensure that the R_w+C_{tr} value is achieved (rather than simply the R_w value). Published R_w values tend to be higher than corresponding R_w+C_{tr} values; therefore, incorrect selection could result in an overestimation of sound reduction performance which in turn could result in higher internal noise levels.

- The opening and free area of the ventilation units should be checked by a mechanical service engineer before designs are finalised. Should the equivalent open area be insufficient to meet the minimum requirements of ADF, it may be necessary to increase the number of units per habitable room. Where this applies, the required sound reduction of the ventilation units may need to be increased accordingly.

4.3 Commercial Noise Impact

Noise levels at MP2 (overlooking the petrol filling station and Bradford Road) were found to be dominated by road traffic on Bradford Road, and commercial noise associated with the PFS was not considered to be significant.

Furthermore, activity at the PFS is screened from the proposed development by the PFS store building.

Notwithstanding the above, noise associated with use of the jet wash at the PFS is considered below.

The PFS includes 2 no. jet washing bays. ENS has previously undertaken noise measurements of a jet wash in use, with noise levels measured at up 72 dB L_{Aeq} at a distance of 4 metres. The noise measurements were wholly dominated by the use of jet washers, mainly the impact noise of the water upon the vehicle. This level is adopted for assessment purposes for the 2 no. jet washing bays.

In order to assess the propagation of noise from activities at the site to the proposed development, noise level predictions have been performed using iNoise acoustic modelling software. This is a software program specifically developed for the prediction and assessment of environmental noise.

The model calculates noise levels on horizontal and vertical grids with a user defined spacing of receiver points. From these levels, calculated at thousands of points, contour lines of constant noise levels are generated and printed as noise maps. All scaling was based on direct import from Google Earth, with 2nd order reflections considered and absorption coefficients based on the iNoise default for brick-built structures.

The following assumptions were used in the model:

- Meteorological conditions: Temp. 20 °C, Relative Humidity 60%
- Foliage/woodland areas not considered to provide any reduction
- Reflections: set to two orders of reflection permitted in the model
- Ground absorption: set to 0.5 (mixed ground)

It is robustly assumed that the 2no. jet wash bays may be in use for 50% of the assessment period.

The predicted resultant noise level at the south-west (most exposed) façade of the proposed development is ≤ 35 dB $L_{Aeq,T}$. Results of the noise modelling are presented in Appendix 3.

As the operating hours are unknown, it is robustly assumed that the jet wash may operate 24/7. The calculated jet wash noise levels are relatively low, and below the background noise levels at the development. However, to account for potentially perceptible character, a +3 dB correction has been robustly applied, in accordance with BS 4142.

On the basis of the above, daytime BS 4142 jet wash noise assessment is set out in Table 4.2 below.

Table 4.2: BS 4142 Assessment (Jet Wash) at Development

Results	Daytime	Night-time	Comment
Specific sound level	35 dB $L_{Aeq\ (1\ hour)}$	35 dB $L_{Aeq\ (15\ min)}$	2no. jet wash bays assumed to operate for 50% of assessment period
Acoustic feature correction	+3 dB	+3 dB	For potential character
Rating level	38 dB $L_{Ar\ (1\ hour)}$	38 dB $L_{Ar\ (15\ min)}$	Rating level at development
Background sound level	54 dB $L_{A90\ (15min)}$	45 dB $L_{A90\ (15min)}$	Background sound levels at development
Excess of rating over background sound level	-16 dB	-7 dB	Indication of a low impact, subject to context

Rating levels are at least 7 dB below the existing background noise levels during the night-time at the NSRs. In accordance with BS 4142, this is an indication of a low impact, subject to context.

It should be noted that rating levels of up to 38 dB $L_{Ar,T}$ are considered to be relatively low in absolute terms. For reference, BS 4142:1997 defines 35 dB $L_{Ar\ (15\ min)}$ as a 'very low' rating level, and the WHO 'Night Noise Guidelines for Europe' considers that 40 dB $L_{Aeq\ (2300–0700)}$ outside represents the Lowest Observed Adverse Effect Level (LOAEL) during the night-time.

This is consistent with observations on site, which noted that road traffic was dominant throughout the survey, and noise from the PFS was not significant.

Furthermore, the glazing and ventilation specification set out above is designed to mitiagte the total ambient noise climate at the site, and is demonstrated to be suitable to achieve good internal noise levels.

On the basis of the above, it is therefore considered that noise associated with the development will have a low impact, and will correlate with a No Observed Adverse Effect Level (NOAEL) in that noise can be heard, but does not cause any change in behaviour or attitude.

5 Summary and Conclusions

A noise impact assessment has been undertaken for the proposed residential conversion of 2 Bridge Street, Batley, WF17 5NU

The noise environment at the site is controlled by road traffic on Bridge Street and Bradford Road. No significant noise was noted from any of the surrounding commercial units.

A scheme of sound insulation works has been developed to protect the proposed residential development from the ambient noise climate.

On the basis of the above, the requirements of the draft panning condition have been met.

Appendix 1 – 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.

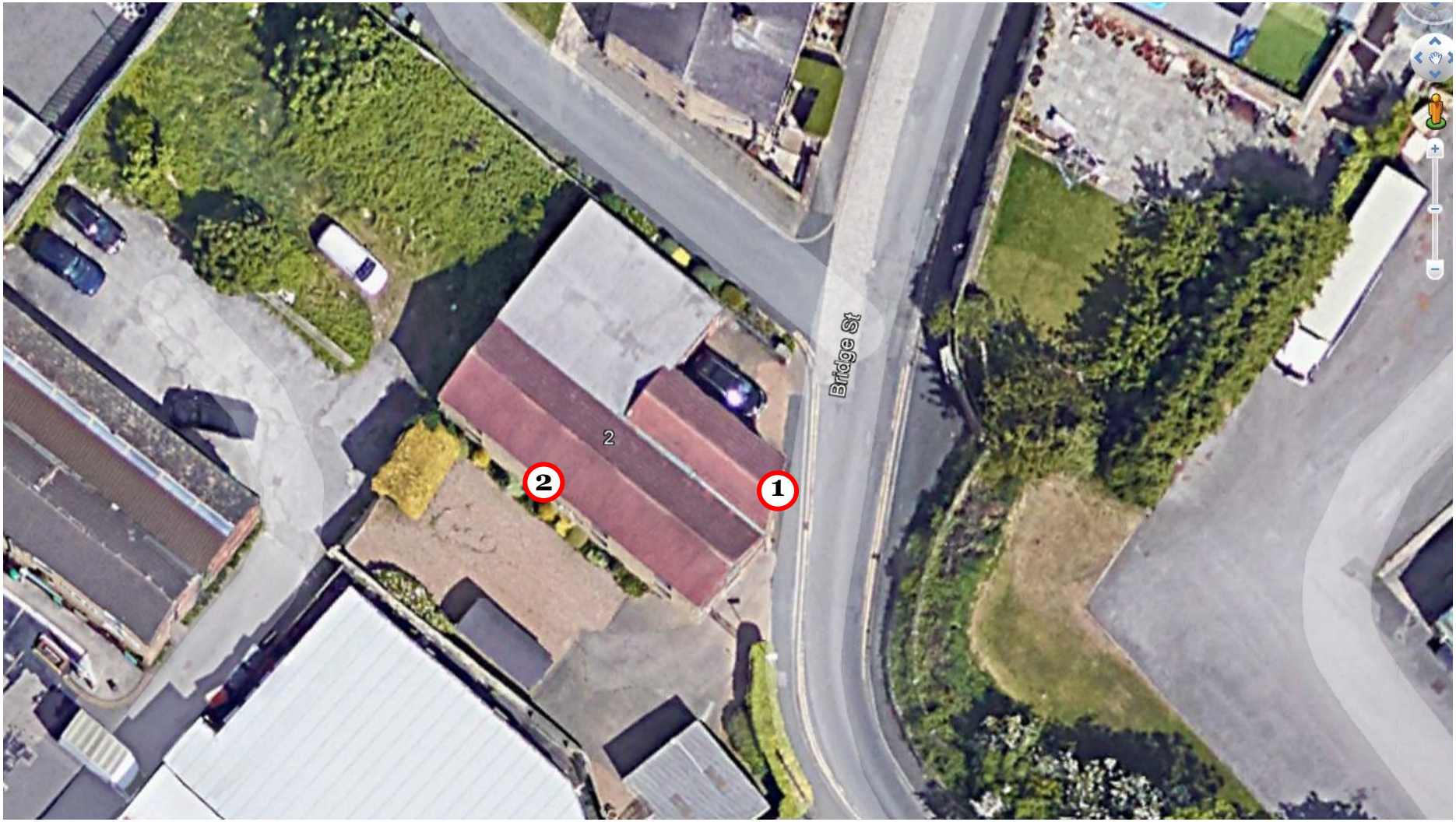
$L_{A90, T}$
The A-weighted sound pressure level of the residual noise in decibels exceeded 90% of a given time interval, T. L_{A90} is typically taken as representative of background noise.

$L_{AF\ max}$
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 2 – Nosie Measurement Positions



Appendix 3 – Noise Modelling Results