



BRADLEY FOLD

Environmental Noise Assessment for Planning Application

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Report Number 2627-235687

Overview

Site Address: Land at Bradley Fold Farm Bradley Fold, Bolton, BL2 6RW

Report no: 2627-235687

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1. Introduction

- 1.1 REDFAN Solutions have been instructed to assess the background noise and impact on the proposed new development at Land at Bradley Fold Farm, Bradley Fold, Bolton, BL2 6RW.
- 1.2 The proposals is for the construction of 2 new houses on a currently vacant patch of lane on the edge of a traditional residential estate and a large warehouse area.
- 1.3 A noise impact report and assessment will be part of the application for the Local Authority to demonstrate that the amenity of occupiers is not adversely affected by noise as well as including further mitigation measures to further future proof the property against increased noise from the warehouse site.
- 1.4 This report outlines the background noise levels at the site as well as providing any acoustic performance specifications that are required to enable the internal noise criteria to be achieved.
- 1.5 The analysis has been based on the current architectural drawings provided by the architects at the date of this report.

2. Criteria

- 2.1 Part 1 and 2 of BS 7445 establishes guidelines to quantities and procedures for environmental noise measurements and a Guide to the acquisition of data pertinent to land use. Guidance provided on instrumentation and calibration, measurement positions, meteorological effects, and information to be recorded.
 - 2.1.1 All equipment shall be calibrated and the configuration for calibration shall be in accordance with the manufacturer's instructions.
 - 2.1.2 A comprehensive recalibration at certain time intervals may be prescribed by authorities responsible for the use of measurement results.
 - 2.1.3 A field check shall be made by the user at least before and after each series of measurements, preferably including an acoustic check of the microphone.
 - 2.1.4 "Outdoor measurements near buildings": these measurements shall be carried out at places where the noise to which a receiver is exposed is of interest. If not otherwise specified, the preferred measurement positions are 1m to 2m from the façade and 1.2m to 1.5m above the ground.

2.1.5 Measurements indoors. These measurements shall be carried out in enclosures where the noise is of interest. At least 1m away from walls and 1.2m to 1.5m above the ground.

2.2 Government guidelines for planning assessment is the National Planning Policy Framework (NPPF) which came into force in March 2012, in July 2018 and the National Planning Policy Guidance (NPPG). This was undated and in the main replaces previous PPG and PPS documentation.

2.3 The NPPF 2024 sets out the Government's economic, environmental and social planning policies for England and Paragraph 187-part e states,

"preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution.

Paragraph 198 part a states,

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:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;

2.4 BS 4142: 2014+A1:2019 "Method for rating and assessing industrial and commercial sound".

This British Standard describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:

- sound from industrial and manufacturing processes;
- sound from fixed installations which comprise mechanical and electrical plant and equipment;
- sound from the loading and unloading of goods and materials at industrial and/or commercial premises;
- sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

The significance of sound impact is to be determined according to the following summary process:

- Determine the background sound levels, in terms of the index LA90, at the receptor locations of interest.
- Determine the specific sound level of the source being assessed, in terms of its LAeqT level (T = 1 hour for day or 15 minutes for night), at the receptor location of interest.
- Apply a rating level acoustic feature correction if the source sound has tonal, impulsive, intermittent, or other characteristics which attract attention.
- Compare the rating sound level with the background sound level; the greater the difference between the two, the higher the likelihood of adverse impact.
- A difference (rating – background) of around +10 dB is an indication of significant adverse impact, depending on the context; a difference of +5 dB is an indication of an adverse impact, depending on the context. 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 upon context.

2.5 BS 4142 introduced the concept of 'context' to the process of identifying noise impact. Section 11 of BS 4142: 2014+A1:2019 explains "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" (our emphasis). An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context" (our emphasis).

There are many context points to consider when undertaking an assessment of sound impact including:

- The absolute level of sound;
- The character and level of the specific sound in the context of the existing noise climate; for example, is the sound to occur in a location already characterised by similar activities as those proposed?
- The sensitivity of the receptors;
- The time and duration that the specific sound is to occur;
- The conclusions of assessments undertaken using alternative assessment methods, for example, WHO guidelines noise values or change in noise level;

2.6 BS4142:2014+A1:2019 notes that:

"Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every

complaint is proof of an adverse impact.” BS4142:2014+A1:2019 outlines guidance for the consideration of the context of the potential impact including consideration of the existing residual sound levels, location and/or absolute sound levels.

To account for the acoustic character of proposed sound sources, BS4142:2014+A1:2019 provides the following with respect to the application of penalties to account for *“the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention”*.

- **Tonality** – *“For sound ranging from not tonal to predominantly tonal the Joint Nordic Method gives a correction of between 0dB and +6dB for tonality. Subjectively, this can be converted to a penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible and 6dB where it is highly perceptible;*
- **Impulsivity** – *A correction of up to +9dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it is clearly perceptible, and 9dB where it is highly perceptible;*
- **Intermittency** – *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 3dB can be applied; and*
- **Other Sound Characteristics** – *Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied.”*

2.7 It is therefore entirely possible that whilst the numerical outcome of a BS 4142: 2014+A1:2019 assessment is indicative of adverse or significant adverse impact, when the proposal is considered in context the significance of the impact is reduced to an acceptable level.

2.8 The NPPG introduces the concept of a noise exposure hierarchy based on likely average response. The guidance contained in the NPPG is summarised in the table below:

Table 1: Noise Exposure Hierarchy Perception Examples

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Noticeable and Intrusive	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Noticeable and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and Intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and Disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Adverse Effect Prevent

2.9 In March 2010 the Department for Environment, Food and Rural Affairs (DEFRA) produced "Noise Policy Statement for England" (NPSE), which states three policy aims, as follows:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- where possible, contribute to the improvement of health and quality of life."

2.10 The "Noise Policy Statement for England", (NPPF) and (NPPG) state that no significant adverse impact should occur through development, but where noise levels fall between a lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

"... 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."

2.11 BS8233:2014 Local Authorities usually stipulate internal noise criteria for new build residential uses based on British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'.

2.12 BS 8233:2014 provides references and guideline values for desirable indoor ambient noise levels for dwellings as shown in Table 2.9 below.

2.13 BS 8233:2014 Desirable Internal Ambient Noise Levels for Dwellings

Table 4 Indoor ambient noise levels for dwellings

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	—
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	—
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

2.14 The table is noted to apply to external noise as it affects the internal acoustic environment from sources without a specific character.

2.15 The above internal ambient noise levels are therefore considered appropriate within this assessment.

2.16 BS 8233:2014 states that 'for traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed an upper guideline value of 55dB L_{Aeq} , which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances...in higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between

elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited’.

2.17 The following table summarises the response to changes in noise level (known as the Semantic Scale).

Table 2: Change in noise level – response and impact.

Change in noise level LAeqT dB	Response	Impact
<3	Imperceptible	None
3 – 5	Perceptible	Slight
6 – 10	Up to a doubling	Significant
11 – 15	More than a doubling	Substantial
> 15	-	Severe

2.18 For good sleep, it is believed that indoor sound pressure levels should not exceed approximately 45dB LAmax more than 10–15 times per night.

2.19 WHO Guidelines for Community Noise

2.19.1 The WHO Guidelines (1999) recommends indoor nighttime guidelines in order to avoid sleep disturbance, the document states these to be 30dB (LAeq) and 45dB (LAfmax) for continuous and individual noise events respectively.

2.19.2 The document states that the number of noise events should also be considered and that individual noise events should not exceed 45dB (LAfmax) more than 10 – 15 times per night.

3. Site Description and Observations

3.1 The proposed construction area hereafter referred to as ‘the site’, is a proposed development of 2 new houses near Bradley Fold Farm.

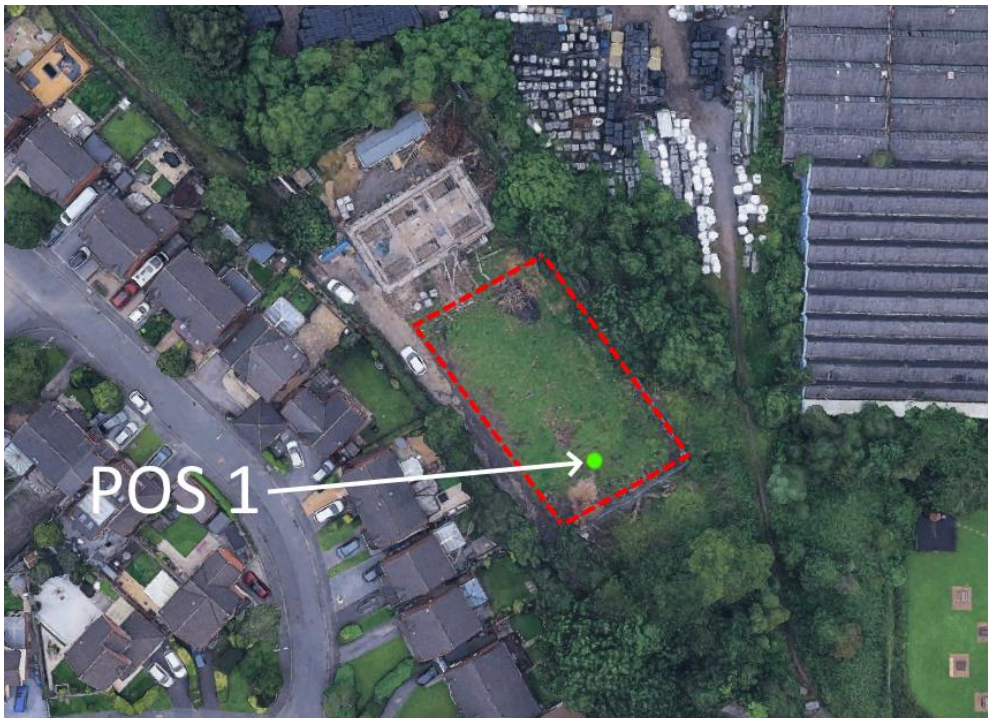
3.2 The proposals will include some small outside amenity spaces and parking spaces.

Noise Sources

3.3 The noise survey was unmanned. Therefore, a subjective assessment of background and ambient noise sources could not be undertaken for the whole monitoring duration. While onsite the dominant noise source was traffic. Secondary noise was from pedestrians and businesses nearby as well as the general hum of city noise.

3.4 There is a pub which has a large garden 60m from the site

3.5 Red lines outline approximate site, and green dot shows position tested.



Main Noise Sources affecting the site

3.6 The site is tucked away from busy roads, and the traffic noise is considered a background constant, but the site itself does not suffer the independent car noises associated with busy trafficked roads. It is this anonymous transportation noise that is considered to be the dominant noise.

3.7 There are several warehouses next to the site offering a range of different businesses. Part of the application is to determine noise mitigation for the possible future changing of use of the warehouses.

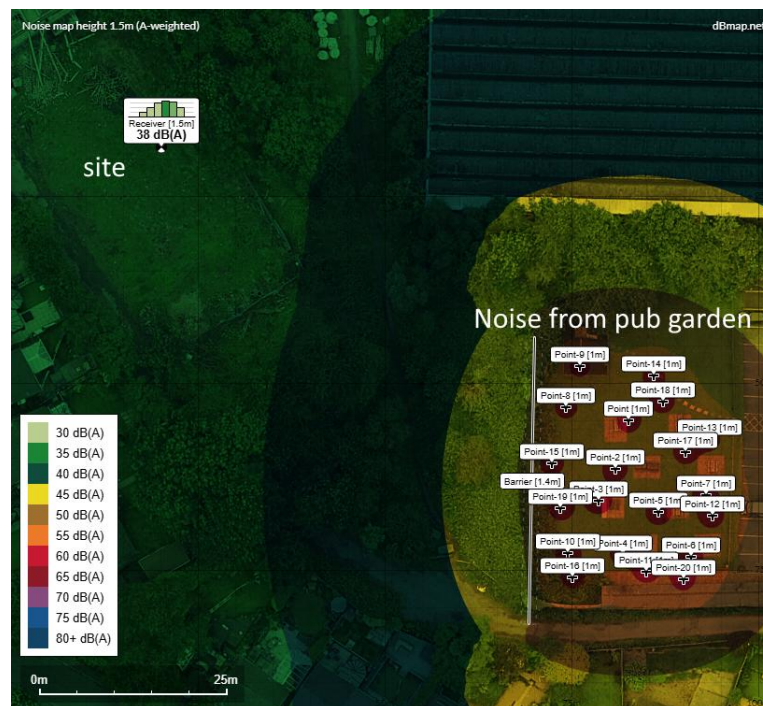
4. Industrial And Commercial Noise

4.1 There is a pub which has a large garden 60m from the site using modelled data impact can be calculated.

4.2 Exact levels for beer gardens are difficult to estimate however, using data a scenario of all 20 tables/groups in the pub garden having a person talking at the same time. This scenario has calculated as noise sources spread across the patio garden area. Noise Control in Building Services (Sound Research Laboratories Ltd, 1988) provide source noise sound power levels for speech; Table below which will be used in this assessment.

Noise Source	Sound Power Level in each Frequency Band, Hz								
	63	125	250	500	1k	2k	4k	8k	dB(A)
Male Voice	57	61	63	68	69	65	54	42	72

4.3 Noise Modelling.



4.4 The measured specific average noise level (LAeq) during the survey was 46dB. The lowest measured background noise level (LA90) was 40 dB during the daytime and 38 dB during the night-time. Methodology outlined in BS 4142, considers it appropriate to apply a penalty of 6 dB to account for tonality (in the case of reversing alarms) or impulsivity (in the case of trailer connection/disconnection). The rating level (LAr) would therefore be 52 dB, which is 12 dB above the lowest measured background noise level during the daytime and 14 dB above the lowest background noise level during the night-time.

4.5 BS 4142 states noise levels would indicate a 'significant adverse impact'. It should be noted however that BS 4142 states the following regarding introducing new noise sensitive receptors to an area with extant industrial/commercial noise sources:

"Where a new noise-sensitive receptor is introduced and there is extant industrial and/or commercial sound, it should be recognized that the industrial and/or

commercial sound forms a component of the acoustic environment. In such circumstances other guidance and criteria in addition to or alternative to this standard can also inform the appropriateness of both introducing a new noise-sensitive receptor and the extent of required noise mitigation.”

4.6 Consideration has been given to absolute noise levels to determine the extent of required noise mitigation.

4.7 Therefore, it is considered appropriate to give consideration to the desirable guideline values from BS 8233 to determine the performance of suitable mitigation measures and using ‘Simple Calculation’ from Section G.1 of BS 8233 internal noise levels can be estimated, assuming closed windows, by subtracting the weighted sound reduction index (R_w) performance of the proposed glazing, from the external free-field level incident on the façade.

5. Environmental Noise Survey

5.1 The unattended survey was undertaken between 12:45 on 24/07/2026 and 07:00 on 27/07/2026.

5.2 Ambient (L_{Aeq}), (L_{A90}), (L_{cfMax}) and (L_{cfMax}) level measurements were taken for a continuous 1-hour period in 5- and 15-minute increments.

5.3 The recordings were taken in 5 minute and 15-minute intervals to prevent any other single noises that would be seen as not representational from affecting the measurements. Prior knowledge of any out of the ordinary potential noise was limited and could have had an impact on the test.

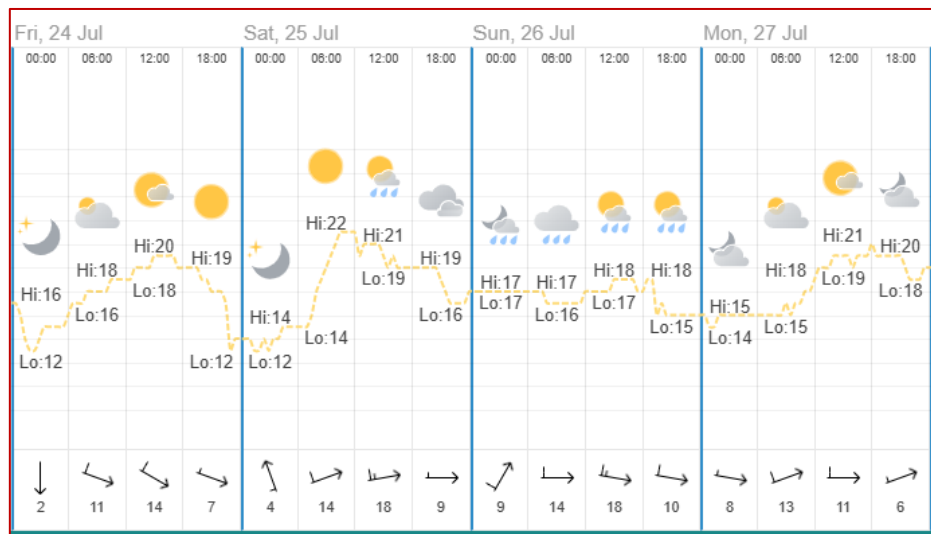
5.4 The sound level meter was positioned as for an outdoor free field measurement and more than 3.5m from the façade of buildings. The microphone was between 1.2m to 1.5m above the ground. The positions were chosen to best represent the ambient noise environment.

5.5 Equipment used for the survey.

Item	Make/Model	Serial No	Calibration Cert No
Calibrator	Norsonic 1255	125526735	U52418
Sound Level Meter	Norsonic 140	1404818	U53555

5.6 Measurements were made following procedures in BS7445:1991 (ISO1966-2:1987) Description and Measurement of Environmental Noise Part 2- Acquisition of data pertinent to land use and BS4142:2014 Method for rating and assessing industrial and commercial sound.

5.7 The weather during the survey.



5.8 The noise monitoring equipment used was calibrated before and after both the noise survey periods. No significant drift was recorded for either. Equipment calibration certificates can be provided upon request.

6. Uncertainty

6.1 All measurements onsite were taken with a sound level meter manufacturer's margin of uncertainty at typically +/- 1.1dB. It is due to the tolerances associated with Class 1 sound level meters and calibrator equipment used to measure background noise.

7. Results

7.1 The section below gives the Baseline Noise Survey readings taken at site.

Date	Location	Time Period	Sound Pressure Level dB (L _{Aeq})	Sound Pressure Level dB (L ₉₀)
24/07/26	POS 1	Daytime (07:00-23:00hrs)	44dB	38dB
		Nighttime (23:00-07:00hrs)	35dB	31dB
25/07/26	POS 1	Daytime (07:00-23:00hrs)	46dB	40dB
		Nighttime (23:00-07:00hrs)	49dB	40dB
26/07/26	POS 1	Daytime (07:00-23:00hrs)	49dB	42dB
		Nighttime (23:00-07:00hrs)	43dB	38dB

7.2 This table gives a condensed final single figure decibel rating at each site position.

Date	Location	Time Period	Sound Pressure Level dB (L _{Aeq})	Sound Pressure Level dB (L ₉₀)
24/07/26-26/07/26	POS 1	Daytime (07:00-23:00hrs)	46dB	40dB
		Nighttime (23:00-07:00hrs)	43dB	38dB

7.3 The average ambient (L_{Aeq}) noise levels at the measurement position during the survey has been based on an analysis of the monitored data.

7.4 The table below shows the L_{Amax} level which has been exceeded more than 10 times in a nighttime period.

Position	Time Period	24/07/26- 26/07/26
POS 1	Nighttime (23:00-07:00hrs)	70dB

8. Future mitigation

8.1 Future-proofing a new dwelling located adjacent to an operational factory is essential because industrial sites can undergo changes in process, equipment, or operating hours that materially increase external noise emissions over time. While the current sound climate may be acceptable, a change of business type, introduction of new plant, or intensification of activity can elevate specific noise sources and alter their acoustic character, potentially resulting in higher L_{Aeq} or impulsive/tonal components that trigger penalties under BS 4142:2014+A1:2019. Designing the new property with enhanced façade insulation, upgraded glazing, and robust external amenity noise controls ensures that the dwelling remains protected against foreseeable increases in industrial noise, maintaining compliance with BS 8233:2014 internal criteria and safeguarding long-term residential amenity even if the factory's operations evolve. The 6dB penalty from 4.2 will be added.

8.2 Using data from previous surveys of from factories operating with forklift trucks, multiple lorry deliveries per day, and fabrication of steel works and CNC machines.

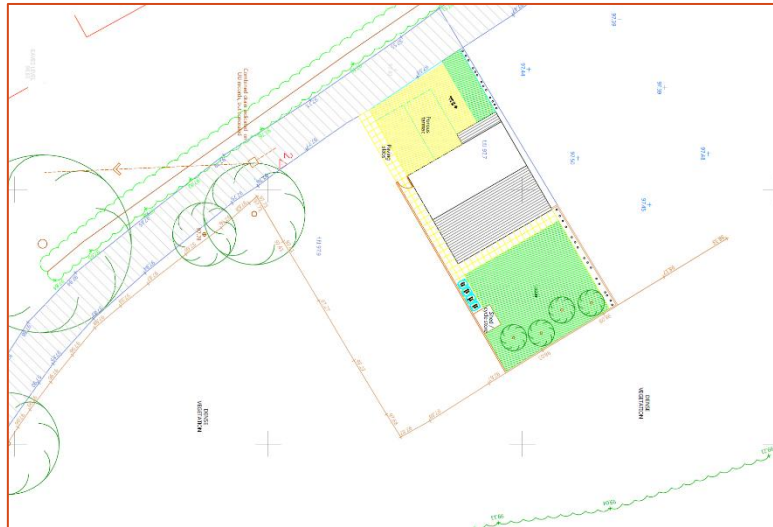
8.3 An L_{eq} 1hr from the activities undertaken of 62dB will be used as a Planer source due to its size.

Unit	Calculation step	Decibels
New	Combined sound pressure noise L_{Aeq} 1hr	62 dB(A) @1m
	Distance Correction (30m)	-15dB
	Noise Character correction BS4142	+5
	Barrier	0
	Rating Level at residential façade – L_{arT} @1m	52dB(A)
	Current - L_{Aeq}	46dB

9. Building Fabric Performance

9.1 The following design review is based on the architectural drawings for the proposed construction and targets the internal noise levels set out in section 2.

9.2 Proposed Plan



9.3 The minimum for all non-glazed elements, i.e. façade walls and the roof systems for the development will be required to provide the following minimum sound insulation performance, if tested in accordance with ISO 10140-2:2010.

Element	Minimum Acoustic performance
All solid Façade Elements	50 (dB R_w)

9.4 In accordance with the 'Simple Calculation' from Section G.1 of BS 8233 internal noise levels can be estimated, assuming closed windows, by subtracting the weighted sound reduction index (R_w) performance of the proposed glazing, from the external free-field level incident on the façade.

9.5 The acoustic performance requirements for glazing of the noise-sensitive rooms are given in the table below, based on the monitoring data and predicted facade levels.

Façade	Minimum single figure weighted sound reduction figure (dB, R_w -Ctr)
Bedrooms	28 4/20/4
Living rooms	28 4/20/4

9.6 It is important that the quoted minimum sound reduction specifications are met by the panels and windows, including frames, seals, etc. Glass performance alone is not an acceptable means of demonstrating compliance with the specification for window performance.

9.7 Below is window make up and their attenuation.

Unit make up	Rw	Ctr	C
4/20/4	33 dB	28 dB	29 dB
6/16/6	33 dB	28 dB	32 dB
6/12/10	37 dB	34 dB	36 dB
6/16/6.4	33 dB	28 dB	32 dB
6/16/6.8A	39 dB	33 dB	37 dB

*Based on Pilkington Glass Laboratory testing

External Areas

9.8 The current design has a amenity area. These spaces are for the amenity of the building's residents. BS 8233:2014 provides external noise level to amenity spaces guidance. *"for traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed an upper guideline value of 55dB LAeq"*.

9.9 With the enhanced future measurements calculated from the potential increase in noise at the from the nearby warehouses, the levels would still be within those specified in BS8233:2014.

Ventilation and Overheating

9.10 Residential properties must comply with approved document F Ventilation; there are three main systems used;

1. Natural Ventilation
2. Continuous Mechanical Extract Ventilation
3. Mechanical Extract Ventilation with Heat Recovery

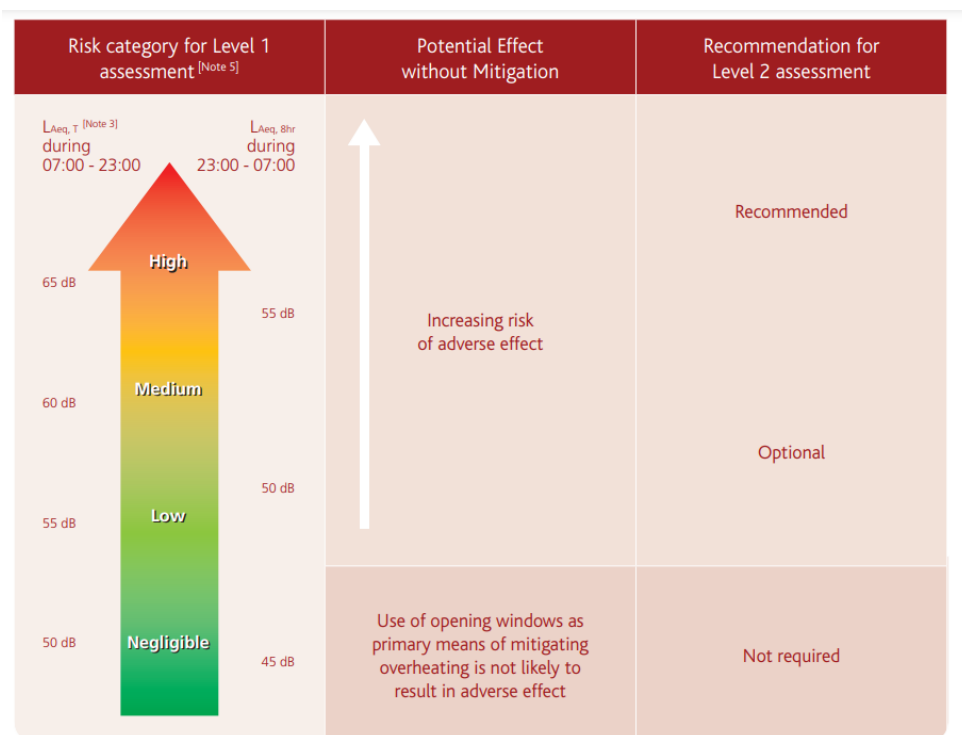
9.11 All types of ventilation are acoustically able to be considered for this construction; however, specific acoustic trickle vent will be required.

9.12 Standard Trickle vents are suitable for the development.

Approved Document O: Overheating

9.13 The ANC (Acoustics & Noise Consultants) and IOA (institute of acoustics) have produced the Acoustics Ventilation and Overheating Residential Design Guide. This Guide is approved by the Government.

- 9.14 This Acoustics, Ventilation and Overheating Guide ('AVO Guide') is intended to be used by acoustic practitioners as well as all those involved in the planning, development, design and commissioning of new dwellings. It recommends an approach to acoustic assessments for new residential development that take due regard of the interdependence of provisions for acoustics, ventilation, and overheating.
- 9.15 Overheating mitigation takes into account if windows are likely to be closed during sleeping hours (11pm to 7am).
- 9.16 The ANC guidance is that windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits:
- a. 40dB LAeq,T, averaged over 8 hours (between 11pm and 7am).
 - b. 55dB LAFmax, more than 10 times a night (between 11pm and 7am).
- 9.17 The assessment determines if acoustically; nighttime noise levels are achieved with partially open windows to mitigate summertime overheating.
- 9.18 Partially opened windows have a recognised typical 13dB attenuation. The assessment takes into consideration the measured environmental noise levels with the 13dB and the BS8233:2014 internal bedroom noise level guidance.
- 9.19 It is suggested here that the desirable internal noise standards within Table 4 of BS 8233:2014 should be achieved when providing adequate ventilation as defined by ADF whole dwelling ventilation. However, it is considered reasonable to allow higher levels of internal ambient noise from sources when higher rates of ventilation are required in relation to the overheating condition.
- 9.20 The basis for this is that the overheating condition occurs for only part of the time. During this period, occupants may accept a trade-off between acoustic and thermal conditions, given that they have some control over their environment. In other words, occupants may, at their own discretion, be more willing to accept higher short-term noise levels in order to achieve better thermal comfort. The importance of control is relevant to daytime exposure, but not to nighttime exposure where the consideration is sleep disturbance.
- 9.21 It is important to note that there is no specific research available to support this view regarding human response to combined exposure to heat and noise. However, the notion that control over one's environment moderates the response to exposure is well established in the field of thermal comfort and underpins the adaptive thermal comfort model.
- 9.22 Figure 3-1 of the document introduces a 2-level noise risk assessment procedure from transport noise which is the primary noise at site. This development is considered to present a "low" risk and should be considered a level 1 assessment of noise. The diagram below shows the risk in relation overheating.



10. Plant Equipment

10.1 BS 4142: 2014+A1:2019 "Method for rating and assessing industrial and commercial sound" gives guidelines in relation to the levels of noise associated with external plant equipment. It is unknown at this current stage if plant equipment will be installed as part of the development however, using data gathered during the survey, a proposed limit of noise at the nearest noise sensitive receptors can be calculated.

10.2 In line with most council and government guidelines the limit of noise should be no louder than 5dB above background (L90) noise.

Parameter	Daytime (07:00-23:00hrs)	Nighttime (23:00-07:00hrs)
Background - (LA90) 15min	40dB	38dB
-5dB below background	-5dB	-5dB
Limit sound level - LAeq	35dB	33dB

11. Conclusion

11.1 Measurements have been made of the prevailing noise climate at Land at Bradley Fold Farm, Bradley Fold, Bolton, BL2 6RW.

- 11.2 The assessment outlined national and local guidance and considers this in relation to the likely operational activity and use of the building and in compliance with BS8233:2014, BS 4142: 2014+A1:2019 & BS 7445.
- 11.3 Environmental noise monitoring has been undertaken at the site. Noise affecting the development was determined to be primarily from road traffic from the surrounding area.
- 11.4 The surveyed and increases potential noise from possible future development at the nearby factory noise levels have been assessed to determine the minimum sound reduction requirements of the external building façade elements to achieve suitable internal noise levels based on the requirements of BS8233:2014.
- 11.5 Mitigation measures including acoustically specified double-glazing.
- 11.6 Given the assessment undertaken, it is considered that a good level of residential amenity will be provided for residents and that the noise impacts associated with the development can be controlled to acceptable level now and in the future.



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Appendices

1. These are the main noise indices in use in the UK.

- dB(A): The human ear does not hear all frequencies with the same intensity. It is most sensitive to sounds in the 500Hz-8kHz range. Above and below this range the ear becomes progressively less sensitive. To compensate for this, sound level meters incorporate electronic filtering to correspond with the varying sensitivity of the ear. This filtering is called A-weighting and Sound Pressure Levels obtained with this weighting are referred to as A-weighted and signified as dB(A).
- LA90: The sound level (in dBA) exceeded for 90% of the time. This unit gives an indication of the sound level during the quieter periods of time in any given sample. It is used to describe the "background noise level" of an area.
- LAeq,T: The equivalent continuous sound pressure level over a period of time, T; (in dBA) This unit may be described as "the notional steady noise level that would provide, over a period, the same energy as the varying noise in question". In other words, the energy average level. This unit is now used to measure a wide variety of

different types of noise of an industrial or commercial nature, as well as road traffic, aircraft and trains.

- LA1: The sound pressure level (in dBA) exceeded for 1% of the time. This unit can give an indication of a regular maximum noise level from such activities as dance music.
- LAe: The sound exposure level, (previously denoted SEL) is the noise level of an event, such as a train or aircraft event, normally expressed in a 1 second time period.
- LAmin: The minimum sound pressure level (in dBA) measured over the time period.
- LAmax: The maximum level of sound (in dBA), i.e. the peak level of sound measured in any given period. This unit is used to measure and assess transient noises, i.e. gun shots, individual vehicles, etc.
- LArT: sound rating level, the a-weighted, leq sound level of an industrial noise during a specified time period, adjusted for tonal character and impulsiveness.

POS 1

	LAeq	L90
12:45	56	40.1
13:00	47.2	42
13:15	45.7	39.9
13:30	47.6	41.2
13:45	46.7	41.6
14:00	46.7	41.5
14:15	47.6	41
14:30	49.4	42.5
14:45	46.9	40.8
15:00	46	40.8
15:15	45.4	39.4
15:30	44.4	38.8
15:45	45.3	39.3
16:00	46.2	39.6
16:15	43.7	38.7
16:30	45.7	39.8
16:45	45.1	40.4
17:00	45.9	41.8
17:15	45.5	40.8
17:30	46.7	40.5
17:45	45.6	39.9
18:00	44.7	40.2
18:15	44	39.7
18:30	48.1	41.7
18:45	45.8	40.6

19:00	44.6	40.3
19:15	44	40.2
19:30	44	39.5
19:45	43.3	37.6
20:00	43.5	36.6
20:15	39.3	36
20:30	41.5	35.9
20:45	42.6	34.9
21:00	41.8	35.5
21:15	37.5	33.8
21:30	38.1	32.7
21:45	37.3	32.5
22:00	34.6	31.9
22:15	35.9	31.8
22:30	37.1	32.4
22:45	36.3	32.6
23:00	40	32.4
23:15	34.7	31.8
23:30	35.8	32.8
23:45	39.6	32.5
00:00	35.3	32.5
00:15	34.2	31.6
00:30	33.2	30.6
00:45	34.4	30.9
01:00	36.2	31.7
01:15	33.5	30.9
01:30	32.1	30.2

01:45	31.9	30
02:00	30.9	29.2
02:15	31.1	28.7
02:30	30.7	29.2
02:45	30.9	29.1
03:00	30.9	28.8
03:15	31.9	29.3
03:30	32.2	29.3
03:45	31	28.8
04:00	31.2	29
04:15	38.2	29.1
04:30	34	29.4
04:45	33.3	30.2
05:00	40.4	30.7
05:15	36.1	31.7
05:30	42	33.8
05:45	42.9	34.8
06:00	40.2	35.3
06:15	41.1	36
06:30	37.7	34.6
06:45	37.7	34.7
07:00	37	33.4
07:15	41.1	35
07:30	42.9	35
07:45	47.1	36.5
08:00	44.4	36.9
08:15	42	36.3

08:30	45.9	38.1
08:45	48.6	42.3
09:00	48.2	41.7
09:15	49.2	43.6
09:30	52	45.5
09:45	50	42.9
10:00	52	45.2
10:15	54.7	46.9
10:30	51.5	45.1
10:45	51.8	45.1
11:00	54	44.1
11:15	50.1	42.1
11:30	52.2	43.9
11:45	50.7	42.8
12:00	49.4	41.7
12:15	49	41.5
12:30	50.4	42.2
12:45	48.4	41.3
13:00	49.9	44.7
13:15	48.9	42.4
13:30	48.5	42.3
13:45	51.4	44.8
14:00	50.1	43.1
14:15	52.5	45.2
14:30	51	43.1
14:45	47.9	42
15:00	48.1	40.5
15:15	48.1	41.4
15:30	48.5	42.4
15:45	47.7	42.1
16:00	46.2	39.3
16:15	47.1	41.2
16:30	46.1	40.1
16:45	42.6	38.8
17:00	43.6	39.2
17:15	47.2	41.4
17:30	45.3	39.8
17:45	44.8	39.6
18:00	43.2	38.1
18:15	43	38.2
18:30	41.7	37.8
18:45	43.9	38.1
19:00	45.7	39.5
19:15	43.3	37.9
19:30	42.1	37.2
19:45	40.4	35.8
20:00	38.2	35

20:15	39.4	35.7
20:30	38.5	34.7
20:45	44.4	35.9
21:00	42.2	35.8
21:15	39.9	34.4
21:30	39	34.2
21:45	39.4	33.5
22:00	38.3	33.6
22:15	42.3	33.8
22:30	38.8	34.5
22:45	41.1	34.4
23:00	49.5	39.5
23:15	52.9	45.3
23:30	50	41.8
23:45	54.1	48
00:00	54.4	48.6
00:15	52.8	43.1
00:30	45.7	37.9
00:45	49.8	40.9
01:00	47	39.3
01:15	51.5	44
01:30	53	46.7
01:45	49.3	41.9
02:00	49.1	39.6
02:15	45.1	36.4
02:30	43.3	35.7
02:45	40.8	34.2
03:00	47.6	37.8
03:15	43.7	36.1
03:30	45.1	35.7
03:45	43.9	34.8
04:00	45.2	35.7
04:15	45.3	37.2
04:30	51.5	42.3
04:45	50.2	39.6
05:00	46	38.1
05:15	47.8	39.3
05:30	51.5	41.8
05:45	49.5	40.2
06:00	53.1	41.5
06:15	53.5	41
06:30	51.8	43.7
06:45	54.8	44.9
07:00	50.8	41.6
07:15	51.7	44.8
07:30	54.2	46.7
07:45	52.8	46.4

08:00	52.1	42.1
08:15	54.1	45.6
08:30	51.7	43.7
08:45	52	43.3
09:00	54.2	45.4
09:15	47.4	40.3
09:30	47.1	39.8
09:45	48.1	42.5
10:00	48.9	42.4
10:15	49.3	41.7
10:30	50.5	44.1
10:45	49.7	41.9
11:00	47.2	42.5
11:15	48.7	41.8
11:30	50.2	42.3
11:45	50.7	44
12:00	50.5	42.2
12:15	51.2	43.9
12:30	53.7	45.3
12:45	58	49.8
13:00	54.9	44
13:15	56.4	44
13:30	51.7	44.6
13:45	49.8	43.4
14:00	48.7	42.4
14:15	50.6	43
14:30	51	44.8
14:45	50.4	42.2
15:00	49.1	43.3
15:15	48.8	42.3
15:30	50.8	44.4
15:45	53.2	45.6
16:00	50.7	44.6
16:15	46.4	41.1
16:30	47	41.6
16:45	48.7	42.4
17:00	48.6	41.4
17:15	49.8	43.5
17:30	47.8	41.1
17:45	50.7	43.3
18:00	52.6	44.1
18:15	51.6	44.4
18:30	45.7	40.1
18:45	43.7	38.6
19:00	41.7	37.6
19:15	43.2	37.5
19:30	42.1	37.5

19:45	42.6	37.6
20:00	44	38.5
20:15	43.5	37.4
20:30	44.7	38.8
20:45	43.6	37.2
21:00	44.1	38.1
21:15	44.7	38
21:30	46.1	35.9
21:45	39.3	34.8
22:00	40.3	35.1
22:15	44.4	36.1
22:30	40	35
22:45	38.5	34
23:00	40.1	34.4
23:15	44.3	36.6
23:30	40.1	34.7
23:45	39.3	34.2

00:00	40.2	33.1
00:15	39.4	32.9
00:30	37.8	32.2
00:45	34.1	29.9
01:00	33.9	29.8
01:15	33.5	28.1
01:30	33	26.2
01:45	34.9	29.3
02:00	32.9	28.6
02:15	38	29.7
02:30	41.2	30.9
02:45	37.2	31.4
03:00	36.5	29.2
03:15	31.9	28.1
03:30	31.2	27.9
03:45	35.3	29
04:00	34.9	29.2

04:15	31.8	28.1
04:30	32.4	28.8
04:45	33.2	28.6
05:00	40.6	30.1
05:15	41.7	31
05:30	40.1	31.8
05:45	38.2	32.5
06:00	41.2	34
06:15	39.1	35.5
06:30	42.5	37.1
06:45	45.6	37.6
07:00	42.8	38.4