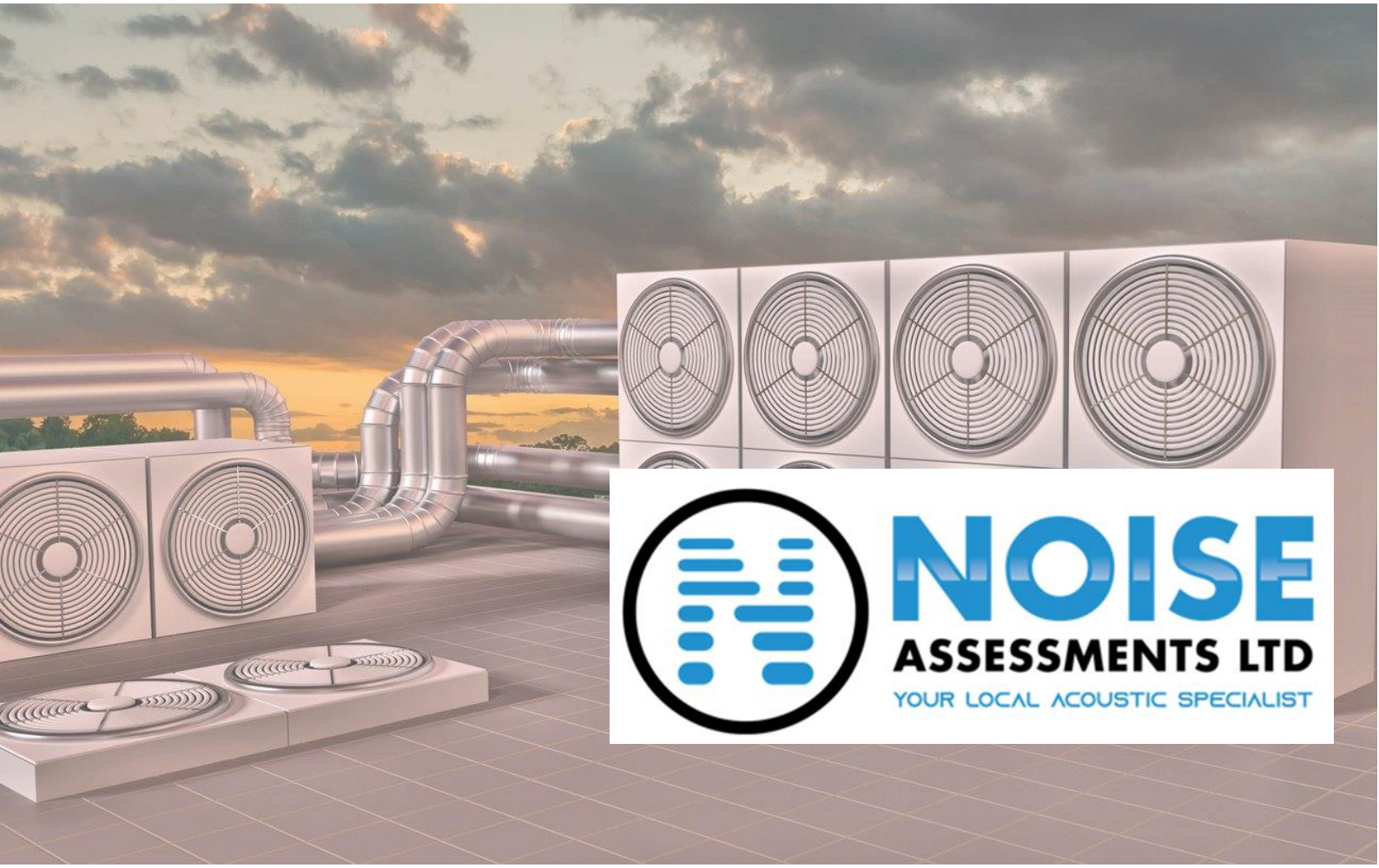


NOISE IMPACT ASSESSMENT

BS 4142:2014+A1:2019

Industrial Noise

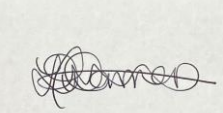


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REPORT DETAILS

Report Title	Noise Assessment: Industrial Noise
Site Address	Britannia Mill Industrial estate, George St, Heywood, OL10 4PW
Project No.	NALPRO050922.01
Consultant Contact	jonathan@noiseassessment.org

QUALITY ASSURANCE

Issue No.	Status	Issue Date	Comments	Author	Approved
1	FINAL	24/09/22	-	 J Mape BSc (Hons) PgDip IOA Cert. Environ. Noise TechIOA Noise Consultant	 D Warren Director

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Assessment Summary

The site has been requested by the local council to undertake a noise impact assessment to confirm that the site noise at Britannia Mill Industrial estate, George St, Heywood, OL10 4PW will not impact nearby residents during the daytime and night-time. The site has storage containers and has vehicle movements in and out of the site during the daytime and occasionally at night.

The proposed operation of the site is to assess the likely noise impact generated at the nearest sensitive receptors which will comply with external noise level guidance.

A **Low Impact** has been identified from the processes at the site in operation at the NSR.

1. Proposal

- 1.1 The site has been requested by the local council to undertake a noise impact assessment to confirm that the site noise at Britannia Mill Industrial estate, George St, Heywood, OL10 4PW will not impact nearby residents during the daytime and night-time. The site has storage containers and has vehicle movements in and out of the site during the daytime and occasionally at night.
- 1.2 The proposed operation of the site is to assess the likely noise impact generated at the nearest sensitive receptors which will comply with external noise level guidance.

The Proposed Operation of the site

- 1.3 A noise assessment is required to assess the likely noise impact from noise generated from the external vehicle movements around the site to nearby sensitive receptors during the daytime and night-time
- 1.4 The Proposed hours of operation are:
 - Monday to Sunday 24hrs
 - Closed during Bank Holidays

2. Existing Context

- 2.1 The site currently stands as an existing storage facility with the nearest residential properties to the south and commercial units to the east and south of the site close to a busy Bridge Street main road.
- 2.2 The environmental health department of the local planning authority could raise concerns of noise emissions from the various vehicle movements on neighbouring noise sensitive residential properties south of the site during the daytime and night-time.

3. Criteria

- 3.1 The following targets have been selected in accordance with 'BS 4142:2014+A1:2019 – Methods for rating and assessing industrial and commercial sound.' This will be achieved when the Rating Level is below the representative background sound level.

4. Noise Policy and Guidance

Noise Policy Statement for England (NPSE)

- 4.1 The NPSE sets out the Government's policy on noise and includes 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.
- 4.2 This long-term vision is supported by the following aims:
- 4.3 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.
- 4.4 There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:
- 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.
- 4.5 Extending these concepts further, NPSE leads to the concept of a significant observed adverse effect level:
- SOAEL (Significant Observed Adverse Effect Level) – this is the level above which significant adverse effects on health and quality of life occur.
- 4.6 NPSE acknowledges that it is not possible to have a single objective noise-based measure that defines NOEL, LOAEL and SOAEL that is applicable to all sources of noise in all situations. It is therefore suggested that more specific advice from other applicable noise standards and guidance could be employed to determine suitable noise level criteria within the overall principles of the NPSE.

National Planning Policy Framework (NPPF)

- 4.7 The revised NPPF was updated on 19 February 2019 and sets out the government's planning policies for England and how these are expected to be applied. This document replaces the first NPPF published in March 2012 and includes minor clarifications to the revised version published in July 2018.

- 4.8 Where issues of noise impact are concerned the NPPF provides brief guidance in Chapter 15 'Conserving and enhancing the natural environment' as follows:

Paragraph 170:

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 soil, air, water or noise pollution or land instability.

Paragraph 180:

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; and
- c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.

Paragraph 182:

Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

Planning Practice Guidance (PPG)

- 4.9 PPG is written in support of the NPPF and provides an increased level of specific planning guidance.

- 4.10 It suggests that noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. It is also suggested that noise should not be considered in isolation and separately from issues such as the economic, social and other environmental dimensions of proposed development.
- 4.11 Local planning authorities' plan-making and decision taking should take account of the acoustic environment and in doing so consider:
- 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; and
 - whether or not a good standard of amenity can be achieved.

Technical Guidance

BS 4142:2014+A1:2019 – Methods for rating and assessing industrial and commercial sound'

BS4142 Is a recognised standard for assessing the noise impact of fixed plant machinery via relation of noise emissions to current background noise levels.

ISO 9613-2 Attenuation of sound during propagation outdoors

The ISO 1996 series of standards specifies methods for the description of noise outdoors in community environments. Part 2 of ISO 9613 is intended to enable noise levels in the community to be predicted from sources of known sound emission. The method is general in the sense that it may be applied to a wide variety of noise sources, and cover most of the major mechanisms of attenuation.

This standard provides guidance on the outdoor propagation of sound. It is widely used to establish the different attenuations that occur during the transmission of the sound from the sources to the receivers. The total attenuation is the sum of the following: geometrical divergence, atmospheric absorption, ground effect, barriers, and miscellaneous other effects.

5. Nearest Sensitive Receptor Locations

- 5.1 The nearest noise sensitive receptors (NSRs) have been identified as residential properties 15m to the south of the site boundary where potential noise will occur from vehicle and door slamming.

6. Subjective Impressions

- 6.1 The noise climate at the site is dominated by road traffic throughout the day including cars and HGVs / LGVs where tyre / road interaction noise was most prominent from Bridge Street, Secondary noise sources have been identified as bird song and commercial noise from businesses near the site.

7. Measurement Locations

- 7.1 Unattended background noise measurements were undertaken within the site boundary, adjacent to the residential properties. The data collected during this period has been used to characterise the existing acoustic environment around the site.
- 7.2 Measurement, NSR locations are shown in figure 1 below and **Appendix A**:

Figure 1: Site layout & Measurement Location



- Background measurement location M1
- site boundary
- ★ NSR1

8. Measurement Procedure

- 8.1 Noise levels were measured on Sunday 11th to Monday 12th September 2022. Full measurement times and durations can be found in **Appendix B**.

9. Measurement Equipment

- 9.1 Measurements were undertaken using a calibrated, Pulsar N45 class 1 sound level meter. Full equipment details can be found in **Appendix C**.
- 9.2 During all measurements the microphone was protected with an outdoor windshield.
- 9.3 The calibration level of the meter was checked before and after the survey with a Pulsar N45 sound calibrator. No significant drift (i.e. no greater than ± 0.5 dB) in the calibration value was observed between the initial and final checks.
- 9.4 The sound level meters were set to measure various noise parameters including LAeq and LMax values using a 'fast' time weighting.
- 9.5 Full calibration details can be found in **Appendix D**.

10. Weather Conditions

- 10.1 Weather conditions were deemed acceptable for background noise measurement. Full meteorological conditions are detailed in **Appendix E**.

11. Background Sound Level

- 11.1 Environmental noise levels were measured on Sunday 11th to Monday 12th September 2022.
- 11.2 The lowest daytime background sound level was measured between 19:30-19:45 as 45 dB LA90,15min.
- 11.3 The lowest night-time background sound level was measured between 03:00-03:15 as 39 dB LA90,15min.

12. Noise Level Predictions

- 12.1 The level of noise in the local environs that arises from a proposed workshop/warehouse, mobile plant and compressors will depend on several factors. The more significant of which are:

- (a) the sound level output of the plant or equipment used on site;
- (b) the periods of operation of the plant on site;
- (c) the distance between the source noise and the receiving position;
- (d) the presence of screening due to barriers;
- (e) the reflection of sound;

(f) hard ground attenuation.

- 12.2 The parameter that is in general use and is recommended internationally for the description of environmental noise at a receptor position is the equivalent continuous sound pressure level, L_{eq} (expressed in dB).
- 12.3 The parameter that is in general use and is recommended internationally for the description of environmental noise at a receptor position is the equivalent continuous sound pressure level, L_{eq} (expressed in dB).
- 12.4 The L_{eq} describes the total amount of acoustic energy measured but does not take any account of the ear's ability to hear certain frequencies more readily than others. Instead, an A-weighting is applied to form the L_{Aeq} (expressed in dB(A)) as this is found to relate better to the loudness of the sound heard.
- 12.5 Noise levels associated with the proposed development have been calculated at nearby noise-sensitive locations based on the following methodology and assumptions.

Prediction Methodology

- 12.6 The prediction method used in this study is based upon that outlined within Annex F of British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites Part 1: Noise. This guidance details methods to estimate noise from 'open sites' which can include quarries, waste disposal sites and long-term construction projects.
- 12.7 The most important elements of this standard used to estimate site noise within this assessment include the sound level of plant/activities, distance attenuation, activity on-time, screening effects, ground absorption and angle of view corrections.
- 12.8 In terms of screening, BS 5228 indicates that a barrier attenuation of 10 dB(A) can be used when the noise screen completely hides the source from the receiver and an attenuation of 5 dB(A) when the screen partially hides the source from the receiver. The standard also recognises that high topographical features, including hills, and buildings can provide greater attenuation.
- 12.9 Hard ground has been assumed for all noise prediction calculations. 'hard' ground is taken to refer to surfaces which are reflective to sound, e.g. paved areas and rolled asphalt, as opposed to 'soft' ground surfaces which absorb sound such as cultivated land or plantations
- 12.10 All noise level predictions have been calculated with the combinations of plant working at the closest point to the assessment location. The predictions are therefore worst-case scenarios which may be of relatively short duration, however, they indicate the potential highest $L_{Aeq,1h}$ noise level to which a particular property or group of properties may be exposed during the working of the site. This worst-case situation may occur intermittently over the lifetime of the

site, but the longer-term noise levels perceived outside of the site boundary would normally be significantly less.

Plant Complement

12.11 Information regarding the working of the site has been based on discussions with the site operator.

12.12 Noise generated from the infrequent use of the car park has been used from a previous study to show the likely impact from people chatting and car door slam. An **L_{Aeq} of 57 dBA** has been used based on a similar assessment.

BS4142:2014 Assessment

13. Specific Sound Levels

13.1 The specific sound level is denoted L_{As} and is the A-weighted, equivalent noise level at the NSR locations over the reference time period.

13.2 The NSRs are located directly opposite the site boundary. See Figure 1 for the location of sensitive receptors.

13.3 The Specific Sound Level of the Predicted worst-case site noise level at the nearest NSR locations is summarised below:

Table 2: Specific Sound Levels

NSR	Specific Sound Level, dB L _{As}
1	31

14. Rating Level

14.1 The specific sound level may be corrected for certain characteristics that make a sound more noticeable at the NSR locations. Corrections for tonality, impulsivity and intermittency may be applied.

14.2 The associated rating penalties and resultant sound rating levels, dB L_{Ar}, are tabulated below:

Table 3: Rating Penalties, dB, and Sound Rating Levels

NSR	dB L _{As}	Tonality	Impulsivity	Intermittency	dB L _{Ar}
1	31	0	0	3	34

15. Rating Level Vs Background

15.1 The rating level is to be compared to the background sound level to determine the resultant noise impact in accordance with BS4142:

A Sound Rating Level at or below the background noise level is indicative of *Low Impact*;

A Sound Rating Level that exceeds the background noise level by around + 5dB is likely an indication of *Adverse Impact*, depending on the context;

A Sound Rating Level that exceeds the background noise level by around + 10dB is likely an indication of *Significant Adverse Impact*, depending on the context.

15.2 The noise impact during the daytime is tabulated below:

Table 4: Noise Impact

NSR	Rating Level, dB L _{Ar}	Difference, dB	Impact
1	34	11	Low Impact

15.3 The noise impact during the night-time is tabulated below:

Table 5: Noise Impact

NSR	Rating Level, dB L _{Ar}	Difference, dB	Impact
1	34	5	Low Impact

15.4 A Low Impact has been identified from the processes at the site in operation at the NSR.

16. Mitigation

16.1 With regards to general site activities, the following noise control measures should also be considered to demonstrate that best practicable means are being implemented and to minimise the potential noise impact on sensitive receptor locations to show a sound rating background level as **Low**.

- a) When arriving by car, turn off music/radio prior to exiting the vehicle in the car park and not to congregate in the car park;
- b) Avoid unnecessary horn usage and revving of engines;
- c) Switch off equipment when not required;
- d) Minimise drop heights of materials where possible.

17. Summary

17.1 The site has been requested by the local council to undertake a noise impact assessment to confirm that the site noise at Britannia Mill Industrial estate, George St, Heywood, OL10 4PW will not impact nearby residents during the daytime and night-time. The site has storage

containers and has vehicle movements in and out of the site during the daytime and occasionally at night.

17.2 The proposed operation of the site is to assess the likely noise impact generated at the nearest sensitive receptors which will comply with external noise level guidance.

17.3 A Low Impact has been identified from the processes at the site in operation at the NSR.

Appendices

APPENDIX A – Photograph of the Site



APPENDIX B - Measurement Details				
Measurement	Start Date	Start Time	End Date	End Time
M1	11/09/22	10:30	12/09/22	11:30

APPENDIX C - Equipment Details				
Equipment	Make	Model	Class	Serial Number
Sound Meter	Pulsar	N45	1	1365
Calibrator	Pulsar	PM1	1	011121C

APPENDIX D - Calibration Details					
Measurement	Calibrator Ref Level (dB)	Level Before (dB)	Deviation Before (dB)	Level After (dB)	Deviation After (dB)
M1	94.0	94.0	0	94.0	0

APPENDIX E - Meteorology Details						
Date	Temp C	Wind Speed m/s*	Wind Direction	Humidity %	Precipitation mm	Cloud Cover (Oktas)
11-12/09/22	12-18	2.9	ssw	84	0.0	5/8

*Windspeeds measured on site using a Skywatch Xplorer 2 Anemo-Thermometer

Noise Attenuation

Utilising Measured Levels

Equipment	Noise Data, dB $L_{Aeq,T}$	r_1 , m	r_2 , m	Barrier	Level at NSR_2
Vehicle movements, chatting, door slam	60	15.0	1.0	-5	31 (NSR1)

Barrier attenuation assumed as 5 dB and 10 dB for the partial and complete blockage of the line of sight respectively between source and receiver as per 'BS5228-1:2009 – Noise and vibration control on construction and open sites' pg. 130.

Point source distance attenuation

$$L_y = 20 \times \log \frac{r_1}{r_2}$$

Where L_y is the distance attenuation factor and $r_{1,2}$ are the source -> measurement distance and source -> NSR distance in metres respectively

APPENDIX F – Terminology and Definitions

Noise

Sound only becomes noise (often defined as ‘unwanted sound’ or sound that is considered undesirable or disruptive) when it causes or contributes to some harmful or otherwise unwanted effect, like annoyance or sleep disturbance.

Acoustic Environment

Sound from all sound sources as modified by the environment.

Equivalent continuous A-weighted sound pressure level $L_{Aeq,T}$

Value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval T , has the same mean square sound pressure as a sound under consideration whose level varies with time.

A-weighting

The human ear is most sensitive to frequencies in the range 1 kHz to 5 kHz. On each side of this range the sensitivity falls off. A-weighting is used in sound level meters to replicate this sensitivity and respond in the same way as the human ear.

Octave Band

Band of frequencies in which the upper limit of the band is twice the frequency of the lower limit.

Maximum Sound Pressure Level $L_{Amax,T}$

Highest value of the A-weighted sound pressure level with a specified time weighting that occurs during a given event or measuring period.

The $L_{A10,T}$ Sound Level

The A-weighted sound pressure that is exceeded for 10% of a given time interval, T . It is often used to evaluate road traffic noise.

The $L_{A90,T}$ Sound Level

The A-weighted sound pressure that is exceeded for 90% of a given time interval, T , measured using time weighting F . It is often referred to as the background noise level and which might in part be an indication of relative quietness at a given location

Free-field Level

The sound pressure level away from reflecting surfaces.

NOTE Measurements made 1.2 m to 1.5 m above the ground and at least 3.5 m away from other reflecting surfaces are usually regarded as free-field. To minimize the effect of reflections the measuring position has to be at least 3.5 m to the side of the reflecting surface (i.e. not 3.5 m from the reflecting surface in the direction of the source).

Façade Level

The sound pressure level 1 m in front of the façade.

NOTE Facade level measurements of LpA are typically 1 dB to 2 dB higher than corresponding free-field measurements because of the reflection from the facade.

Indoor Ambient Noise

Noise in a given situation at a given time, usually composed of noise from many sources, inside and outside the building, but excluding noise from activities of the occupants.



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