

FEBRUARY 23, 2023



**BS4142:2014 ASSESSMENT OF
9 UNITS ON THE LAND ADJACENT TO
CALDERSHAW BUSINESS CENTRE,
INGS LANE,
ROCHDALE
OL12 7LQ**

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1.0 Introduction

- 1.0.1 This report has been commissioned to determine the noise impact of the creation of 9 industrial units on the currently vacant land adjacent to Caldershaw Business Centre, Ings Lane, Rochdale OL12 7LQ.
- 1.0.2 The assessment has been conducted in line with the BS4142:2014.

2.0 Site Details

- 2.0.1 The site is located between the various industrial buildings making up Caldershaw Industrial Estate to the North, Pennine fencing & Landscaping to the South, a green space and reservoir area to the West and finally residential properties to the South-West on Cutgate Road.
- 2.0.2 The new unit is to be a B8 industrial facility primarily as a let-out places for industrial/manufacturing use.
- 2.0.3 The closest Noise Sensitive Receptors (NSRs) are located approximately 80m to the South on Cutgate Road.

2.1 Location of Monitors

- 2.1.1 The noise location was chosen based on the background level of the proposed development. There was also a large mast and existing generator in the area that was important to measure the existing specific noise level of so that any imposed limits were not immediately exceeded by this source.

Figure 1



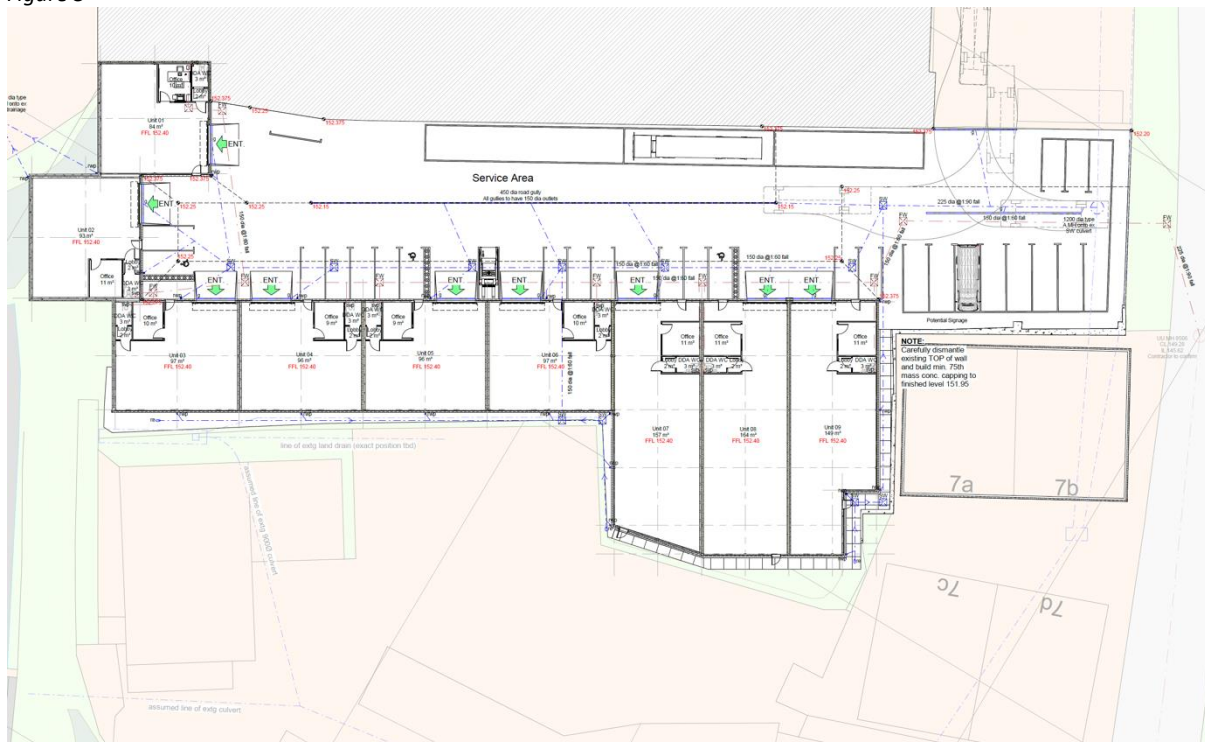
Figure 2



- 2.1.2 Measurements were made in 15 minute periods, on 1 second averaging, to allow for the removal of anomalies and increased accuracy. The data was averaged into L_{Aeq1hr} daytime data also recorded for L_{A90} .
- 2.1.3 The monitoring was conducted using 1 x Type 1 Nti XL2 sound level meter with batteries and outdoor microphone protection.
- 2.1.4 All measurements were taken after a field calibration was undertaken to ensure accuracy and repeatability of measurements. Drift was also checked at the end of the measurements to validate the data captured.
- 2.1.5 Further data such as wind speed, wind direction, rainfall intensity, temperature and cloud cover were all recorded at the beginning and end of the assessment at the monitoring location.
- 2.1.6 Any anomalies (such as noise by the engineer during setup and collection of the kit) were removed from the survey for a true reflection of the ambient levels in the vicinity. This was done by recording audio throughout the survey at each location and listening back through the files during the analysis process to confirm what was recorded manually during the survey.

2.2 Plan Views of Proposed Site

Figure 3



3.0 Legislation

3.0.1 The National Planning Policy Framework (NPPF) sets out the Government's economic, environmental and social planning policies for England and "these policies articulate the Government's vision of sustainable development." In respect of noise, Paragraph 174 of the NPPF states the following:

"Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) 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 185 goes on to mention:

"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;"

3.0.2 The NPPF reinforces the March 2010 DEFRA publication, "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."

3.0.3 Together, the first two aims require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the 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.”

3.1 BS4142:2014 +A1 (2019)

- 3.1.1 Noise effects on residential properties have been assessed according to the guidance in BS 4142:2014. This standard primarily provides a numerical method by which to determine the significance of sound of an industrial nature (i.e. the ‘specific sound’ from the proposed development) at residential sensitive receptors.
- 3.1.2 The specific sound level may then be corrected for the character of the sound (e.g. perceptibility of tones and/or impulses), if appropriate, and it is then termed the ‘rating level’, whether or not a rating penalty is applied. The ‘residual sound’ is defined as the ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.
- 3.1.3 According to BS 4142:2014, the background sound levels adopted for the assessment should be representative of the periods being assessed. The standard recommends that the background sound level should be collected from continuous measurements of normally not less than 15-minute intervals. However, the Standard states that there is no ‘single’ background sound level that can be derived from such measurements. It is particularly difficult to determine what is ‘representative’ of the night-time period because it can be subject to a wide variation in background sound levels between the shoulder night periods.
- 3.1.4 The method chosen for this section of the report is to use the data collected at the nearest NSR for the day periods to provide the ambient and background noise levels. The mode $L_{Aeq_1hr(Day)}$ value will then be used for each time period over the course of the measurement as the most appropriate way of creating a representative value.
- 3.2.6 The specific sound levels have been determined separately in terms of the L_{Aeq1hr} during the daytime. Daytime is typically between 07:00 and 23:00 hours and night-time is typically between 23:00 and 07:00 hours, so these periods have been adopted for this assessment.

3.2.7 At each of the most likely sensitive receptor locations, the rating level has been determined from the predicted specific sound level. Where it has considered it to be appropriate, a rating penalty has been applied for tonality, impulsivity and/or intermittent specific sounds as described in the commentary to paragraph 9.2 of BS4142:2014. This has been applied with consideration for the main sound sources from site that contribute to the level of specific sound at the receptor location.

3.2.8 As per the requirements of the standard, an initial estimate of the impact of the specific sound has been obtained by subtracting the measured background sound level from the rating level of the specific sound. Table 1 provides the initial evaluation of impact following this method.

Table 1

Magnitude	Difference Between rating Level and Background Level	Comments
High	+10dB	Significant Adverse impact Likely
Medium	+5 to +10dB	Adverse impact Likely
Low	0 to +5 dB	Low Chance of Adverse Impact
Negligible	Less than 0dB	Low Chance of Adverse Impact

3.1.9 Following the initial evaluation of impact, the context of the sound has also been considered, which is a key requirement of the Standard. In evaluation of the context, the following factors have been considered:

- the absolute level of the sound;
- the character and level of the residual sound compared to the character and level of the specific sound and
- the sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

3.2 Local Authority Specific Criteria

3.2.1 “Noise from the units shall not exceed 50 dBA L_{Aeq} 1 hour between 07.00 - 23.00 Monday to Friday, and between 08:00 - 23:00 Saturday, and 40 dBA L_{Aeq} 5mins at all other times measured at or beyond the boundary of any noise sensitive premises”.

3.2.2 “There shall be no movements of HGV’s or forklift trucks within the open areas of the site other than between 07:30-23:00 Monday to Friday and 08:00-23:00 Saturday.”

5.0 Industrial/Commercial Target Noise Level

- 5.0.1 In the absence of specific details of any noise sources/machinery noise that may be used within the proposed facility, BS4142:2014 requires the creation of a target noise level (LA_r). This is done by looking at the background noise level measured and using that as the benchmark.
- 5.0.2 The proposed facility is not thought to be in use through both day and night periods. For this reason the daytime LA_r has been created. If the facility is upgraded to 24hrs use in future then a further assessment will be required on the night-time background noise levels for the area, and a night-time LA_r also applied to the site. This will also be the case if plant is added by any future tenants of the development that runs into the night-time period.
- 5.0.3 When considering table 1 in this report, and extract from BS4142:2014, it can be seen that any specific noise source brought into the soundscape is required to be 0dBA above background levels in order to avoid adverse impact on the locality. A specific noise level of 0-5dBA above background levels would produce an outcome of 'adverse impact unlikely'. With this in mind the LA_r figure set should be less than or equal to the background noise level for minimal impact on the residential area. This is based on the proximity of the closest NSR (Noise Sensitive Receptor) to the proposed development.
- 5.0.4 This can be assessed by performing a simple calculation to make sure that the NSR approximately 80m away is not impacted upon. Due to the terrain, it was not possible to take a background measurement any closer to the boundary with the nearest NSR. A distance correction can then be applied to make sure background levels at the nearest NSR are not exceeded by the proposed development. Guidance during the initial application, as mentioned in section 3.2, was that the boundary limit at the nearest NSR did not exceed 50dBA This is done using the following calculation;

$$L_s = L_1 + 20 \log \left(\frac{R_2}{R_1} \right)$$

Where L_s = Specific Noise Level at Proposed Development
 L_1 = Specific Noise Level at NSR
 R_1 = 1m (distance to Source)
 R_2 = NSR distance to source (80m)

Daytime
$$L_s = 50 + 20 \log \left(\frac{R_2}{R_1} \right)$$

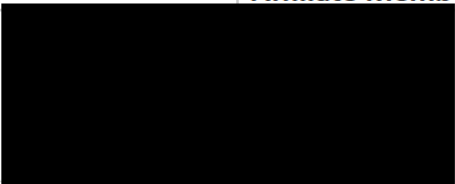
$$\underline{L_s = 88\text{dBA}}$$

- 5.0.5 Based on the above calculation the LAeq_1hr should not exceed 88dBA as a combined noise level for the entire development. This is based on plant noise that has a direct line-of-sight to the NSR along Cutgate Road.
- 5.0.6 Any break-out noise from the proposed developments is likely to have less of an impact as the industrial area has been designed both to face away from the nearest NSR, provide a shielding acoustic barrier to the noise sources and also make sure that deliveries are also made on this side of the development. Under ProPG planning design models there are no further amendments that could be made to the design to improve the impact on the local area from an acoustic perspective.

6.0 Conclusion and Further Comments

- 6.0.1 In the current proposed state the industrial buildings do not provide any further noise levels to the soundscape. It therefore does not provide a specific noise level for the BS4142:2014 assessment. This report has, however, provided the levels that should be adhered to for any further tenants of these premises.
- 6.0.2 Any additional machinery or plant added to the facility in the future should provide no more than a 80dBA (to provide a more conservative figure) external noise level (or breakout noise level if the noise source is internal) to avoid an increase in the background noise level.
- 6.0.3 With the nearest sensitive receptors being approximately 80m away, any noise sources introduced to the area will not create an adverse impact on the residents if they meet the above criteria. This is based on the simple calculation for reduction of sound impact over distance.
- 6.0.4 If any tenant introduces noise with certain characteristics (impulsive, tonal or intermittent) then a further assessment may be required on individual basis to make sure there is no adverse impact on the residential properties in the vicinity.
- 6.0.5 The background noise survey conducted in the existing vacant area provided a LAeq_1hr figure of 59dBA from the existing noise source. This shows that the existing industrial noise also meets the criteria to avoid adverse impact on NSR in the area. Any future noise sources add to the development post completion should consider the existence of this noise source. The limit figure set in section 5.0.4 is a combined noise limit for all sources in the area to prevent the 50dBA LAeq_1hr limit at the NSR being exceeded.

7.0 Credentials

Name	Title	Credentials
James Flitton BSc AMIOA	Acoustic Consultant	CSCS Professionally Qualified person
		Associate Member Institute of Acoustics
		IOA Diploma in Acoustics & Noise Control
		Affiliate Member of IDE
Signed		

Appendix A – Acoustic Terminology

Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near ($L_{Aeq T}$).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s_1 and s_2 is given by $20 \log_{10} (s_1/s_2)$. The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20\mu\text{Pa}$. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L_{Ax}	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Fast Time Weighting	Setting on sound level meter, denoted by a subscript F, that determines the speed at which the instrument responds to changes in the amplitude of any measured signal. The fast time weighting can lead to higher values than the slow time weighting when rapidly changing signals are measured. The average time constant for the fast response setting is 0.125 (1/8) seconds.
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
$L_{Aeq T}$	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
$L_{max T}$	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L_{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L_{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
$L_{10 T}$	A noise level index. The noise level exceeded for 10% of the time over the period T. L_{10} can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. $L_{A10 18h}$ is the A-weighted arithmetic average of the 18 hourly $L_{A10 1h}$ values from 06:00-24:00.
$L_{90 T}$	A noise level index. The noise level exceeded for 90% of the time over the period T. Generally used to describe background noise level.

Appendix B – Survey Instrumentation

Type	Manufacturer	Model	Serial Number	Last Cal	Cal Due
SLM	NTi	XL2-TA	A2A-18475-E0	19/10/2022	18/10/2024
Pre-amp	NTi	MA220	9378	19/10/2022	18/10/2024
Microphone	NTi	MC230A	A19093	19/10/2022	18/10/2024
Calibrator	NTi	CAL200	19829	20/11/2023	20/11/2024

Appendix C – Weather Conditions Chart Used

Weather Conditions				
Measurement Location	Date/Time	Description	Beginning of Survey	End of Survey
As indicated on Error! Reference source not found.		Temperature:		
Cloud Cover Symbol Scale in oktas (eighths)  0 Sky completely clear  1  2  3  4 Sky half cloudy  5  6  7  8 Sky completely cloudy  (9) Sky obstructed from view		Precipitation:		
		Cloud cover (oktas - see guide)		
		Presence of fog/snow/ice		
		Presence of damp roads/wet ground		
		Wind Speed (m/s)		
		Wind Direction		
		Conditions that may cause temperature inversion (i.e. calm nights with no cloud)		

