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Site Address:	190 Milkstone Road, Rochdale, OL11 1NA
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Scope of Work:	Baseline Noise Survey and Impact Assessment for proposed development of 190 Milkstone Road.

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1. Introduction

1.1 REDFAN Solutions have been instructed to assess the background noise and impact on a proposed development of 190 Milkstone Road.

1.2 A baseline survey and CTRN surveys were conducted.

1.3 This report outlines the background noise levels the CTRN at the site as well also provides any acoustic performance specifications that are required to enable the internal noise criteria to be achieved.

1.4 Monitoring of the prevailing background noise was undertaken over a 5-day period.

2. Criteria

BS8233:2014

2.1 Local Authorities usually stipulate internal noise criteria for residential buildings use levels based on British Standard 8233:2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'.

2.2 BS 8233:2014 provides references and guideline values for desirable indoor ambient noise levels for dwellings as shown in Table 2.8 below.

2.3 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 $L_{Aeq,8hour}$

- 2.4 The table is noted to apply to external noise as it affects the internal acoustic environment from sources without a specific character.
- 2.5 The above internal ambient noise levels are therefore considered appropriate within this assessment.
- 2.6 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 LAeq, 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'.

Changes in noise level

- 2.7 The Institute of Environmental Management and Assessment (IEMA) 'Guidelines for Environmental Noise Impact Assessment' provides guidance on the sensitivity of receptors to changes in noise levels. Changes in noise levels of less than 3dBA are not perceptible under normal conditions and changes of 10dB are equivalent to a doubling of loudness. This guidance has been accepted by Inspectors, at Inquiry, to encompass changes in noise levels in the index LAeq,T.
- 2.8 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

- 2.9 BS 7445:2003 "Description and measurement of environmental noise"

Part 1 of BS 7445 establishes guidelines to quantities and procedures for environmental noise measurements. Guidance provided on instrumentation and

calibration, measurement positions, meteorological effects, and information to be recorded.

- All equipment shall be calibrated and the configuration for calibration shall be in accordance with the manufacturer's instructions.
- A comprehensive recalibration at certain time intervals may be prescribed by authorities responsible for the use of measurement results.
- 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.
- "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.

2.10 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 +10dB is an indication of significant adverse impact, depending on the context; a difference of +5dB 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.

2.11 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;

2.12 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.

2.13 WHO Guidelines for Community Noise

2.13.1 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.

2.13.2 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.

2.14 The unattended survey was undertaken on 04/03/2024 between 14:00 and 22:00 on 07/03/24. The monitoring equipment was placed at what will be the front façade of the proposed dwelling, closest to the main road. Measurements taken were (LAeq), (LA90), (LcfMax) and (LcfMax)

3. Site Description and Observations

- 3.1 The proposed construction area hereafter referred to as 'the site', is a proposed development of converting an existing 2 bed terrace home on Milkstone Road potentially into either flats or a multiple occupancy residence. The site is situated to the south of Rochdale town centre on a 2-way road with parking to the front of the properties, the area is predominantly residential roads with some businesses and shops nearby. The A664 (Rochdale Bypass) is approximately 250m to the south of the site. The rear of the property backs onto open green spaces with trees and grass areas.
- 3.2 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 road traffic and pedestrians. Secondary noise was from birds, other wildlife. There is also a school approximability 150m from the site and during break times, children can be heard.
- 3.3 Red lines outline approximate site and green dot shows position tested.



4. Environmental Noise Survey

- 4.1 The unmanned Environmental Noise Survey was undertaken on 04/03/2024 between 14:00 and 22:00 on 07/03/24.
- 4.2 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.

4.3 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.

4.4 The sound level meter was not positioned as for an outdoor free field measurement and is less than 4m from the façade of any buildings and 1.2m to 1.5m above the ground. A 3dB reduction adjustment will be made to the recorded measurements. The position was chosen to best represent the ambient noise environment.

4.5 Equipment used for the survey.

Item	Make/Model	Serial no	Calibration Cert no
Calibrator	Norsonic 1255	125525488	U45621
Sound Level Meter	Norsonic 140	1404818	U46539

4.6 The Noise Survey and measurements were conducted as BS 7445:2003 establishes guidelines to quantities and procedures for environmental noise measurements.

4.7 Weather conditions throughout the unmanned survey were classed as overcast with light to heavy rain at times, temperature of between 0-12°C and wind had no set direction throughout the test and speeds did not exceed (<5m/s) and cloud cover varied throughout testing.

4.8 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.

4.9 Calculation of Road Traffic Noise #

Testing positions green dot position CTRN



4.10 The CRTN document provides a shortened measurement method for road traffic noise-dominated sites.

4.10.1 L_{A10} noise levels can be measured over three consecutive one hour periods between 10:00 and 17:00 hours.

4.10.2 The measured L_{A10} measurements are then arithmetically averaged to provide $L_{A10}(3 \text{ hour})$.

4.10.3 CRTN states that: $L_{A10}(18 \text{ hour}) = L_{A10}(3 \text{ hour}) - 1\text{dB}$

4.10.4 This can be corrected to provide a 16-hour L_{Aeq}

4.10.5 $L_{Aeq}(16 \text{ hour}) = L_{A10}(18 \text{ hour}) - 2\text{dB}$

4.11 Measuring took place from 14:00 till 17:00.

4.12 The equipment was positioned 2m from the carriage way.

4.13 The result of the CRTN was 63dB $L_{A10}(18 \text{ hour})$

4.14 Road noise is classed as a "line source" the calculation for level difference for a line source is

$$L_2 = L_1 - 10 \times \log \left(\frac{r_2}{r_1} \right)$$

r_1 = the distance the recording was taken from the noise source

r_2 = the distance to the nearest noise sensitive receptor

L_1 = the sound pressure recorded

L_2 = the sound level that carries to the noise sensitive receptor

4.15
$$L_2 = 64\text{dB} - 10 \times \log \left(\frac{3}{2} \right) = 62\text{dB}$$

5. Uncertainty

5.1 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.

6. Results

6.1 The table below gives the Baseline Noise Survey readings taken at site.

Date	Time Period	Sound pressure level dB (L_{Aeq})
04/03/24	Daytime (07:00-23:00hrs)	63dB
	Nighttime (23:00-07:00hrs)	54dB
05/03/24	Daytime (07:00-23:00hrs)	62dB
	Nighttime (23:00-07:00hrs)	54dB
06/03/24	Daytime (07:00-23:00hrs)	63dB
	Nighttime (23:00-07:00hrs)	54dB
07/03/24	Daytime (07:00-23:00hrs)	64dB
	Nighttime (23:00-07:00hrs)	N/A

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

6.3 The daytime (07.00-23.00hrs) loudest ambient noise level is 64dB (L_{Aeq}) 1hr with a nighttime (23.00-07.00hrs) loudest ambient noise level is 54dB (L_{Aeq}) 15min.

6.4 There were not more than 8 nighttime single incident noises that would be considered more than 45dB after the consideration of glazing attenuation.

7. Conclusions

7.1 Condensed results of testing performed.

Time Period	Average Sound pressure level dB (L_{Aeq})
Daytime (07:00-23:00hrs)	63dB
Nighttime (23:00-07:00hrs)	54dB
CTRN	62dB

7.2 The assessment outlined national and local guidance and considers this in relation to the likely operational activity and use of the building.

7.3 To comply with standards detailed in BS 8233:2014 and most likely required by the Rochdale Borough Council, a sound attenuation of 28dB is required. The current double skinned brick-built façade of the building if in a good state of repair will prevent noise intrusion of these levels. Should any further construction or any replacement of the external wall happen it is recommended that the double skinned brick build is continued, however if it is not then the new construction type should have either a tested or modelled sound attenuation level with a minimum 28dB.

7.4 Windows will require an attenuation of 28dB, This should include the R_w (C;Ctr).The window supplier should supply test data or modelled predictions for the window system proposed to show compliance with the attenuation detailed. This is critical to ensuring that the sound insulation requirements will be met. Good levels of workmanship are required throughout the build.

7.5 Below is window make up and their attenuation.

Unit make up	R_w	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

7.6 Other than the school which has a very minimal impact and only at specific times which is nearby, it is considered that there are no other sources of noise near the site that are deemed to have an adverse impact acoustically to the development.

7.7 The site has existing outside space to the rear of the property and as the development will not be creating outside space that was not already there. The assessment of outside spaces is not considered relevant in this assessment.

7.8 Windows being opened for ventilation and overheating is not required for extensions, refurbishments, or renovations; Building regulations state that the ventilation is no worse than before the works began.

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.

2. Leq (1hr) from test.

Date	LAeq
(2024/03/04 13:08:04.00)	65
(2024/03/04 13:23:06.00)	66
(2024/03/04 13:38:07.00)	66
(2024/03/04 13:53:10.00)	66
(2024/03/04 14:08:11.00)	66
(2024/03/04 14:23:13.00)	66
(2024/03/04 14:38:15.00)	66
(2024/03/04 14:53:17.00)	66
(2024/03/04 15:08:19.00)	66
(2024/03/04 15:23:21.00)	68
(2024/03/04 15:38:23.00)	67
(2024/03/04 15:53:25.00)	66
(2024/03/04 16:08:27.00)	67
(2024/03/04 16:23:29.00)	67
(2024/03/04 16:38:31.00)	65
(2024/03/04 16:53:33.00)	66
(2024/03/04 17:08:35.00)	66
(2024/03/04 17:23:37.00)	67
(2024/03/04 17:38:39.00)	66
(2024/03/04 17:53:40.00)	67
(2024/03/04 18:08:42.00)	67
(2024/03/04 18:23:44.00)	66
(2024/03/04 18:38:46.00)	66
(2024/03/04 18:53:48.00)	65
(2024/03/04 19:08:50.00)	65
(2024/03/04 19:23:52.00)	76
(2024/03/04 19:38:54.00)	78
(2024/03/04 19:53:56.00)	65
(2024/03/04 20:08:58.00)	65
(2024/03/04 20:24:00.00)	64
(2024/03/04 20:39:02.00)	64
(2024/03/04 20:54:04.00)	64
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