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Noise Impact Assessment

Client: Paul Sheerin

Site: Spotland Bridge Mill, Rochdale OL11 5BU.

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Executive Summary

A Noise Impact Assessment has been undertaken at Spotland Bridge Mill, Spotland Road, Rochdale OL11 5BU, in relation to the proposed change of use of part of the ground floor to a Distillery and Gin Experience area. The assessment has been undertaken to determine noise rating level limits for any potential future external plant installations.

The nearest or most-affected Noise Sensitive Receptors (NSRs) were identified as the residential properties that surround the site. The closest habitable room windows of the NSRs will be considered as a specific reception point in calculations.

Using the measured background noise survey data, a representative daytime and night-time background sound level of **54dB L_{A90}** and **33dB L_{A90}** respectively was derived for the assessment.

Measurements of the prevailing background noise climate were undertaken from the 28th – 31st July 2023 at a location representative of the identified Noise Sensitive Receptors (NSRs).

The daytime and night-time background noise levels for the area have been determined and a maximum noise rating level has been provided that noise levels from any future plant installations should not exceed.

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1. Introduction

Overview

A Noise Impact Assessment has been undertaken at Spotland Bridge Mill, Rochdale, OL11 5BU, in relation to the external plant associated with the proposed change of use to a Distillery and Gin Experience Area.

No external plant details have been provided therefore an Initial Impact Assessment will be undertaken to determine the limiting noise level for any potential future plant.

An assessment is to be undertaken to determine whether residents are likely to suffer a loss of amenity as a result of noise from potential future plant installations.

Scope & Objectives

The scope of the noise assessment can be summarised as follows:

- Baseline sound monitoring survey to evaluate the prevailing background sound levels at the Noise Sensitive Receptor ('NSR') in accordance with BS7445 - '*Description and Measurement of Environmental Noise*';
- Determination of day and nighttime noise rating level limits to not exceed the measured background level at 1m external to the nearest sensitive receptor in accordance with BS4142.
- Further information on the legislation can be found in **Appendix G**.

2. Environmental Noise Survey

Measurement Methodology

To establish the existing environmental noise levels on site, a noise survey was conducted from the 28th to the 31st July 2023 between 10:30 till 09:15. Measurements of $L_{Aeq,T}$ and $L_{A90,T}$ were logged in 5-minute intervals in accordance with BS7445 - '*Description and Measurement of Environmental Noise*'.

The unattended monitoring location (M1) was positioned on the existing fire escape at a height of approximately 2 metres. This position was chosen as it is representative of the NSRs that surround the site.

Further detail of the measurement along with site pictures is given in **Appendix A**.

Measurements were obtained using Class 1 instrumentation. Full equipment details are given in **Appendix B**.

Equipment was calibrated before and after use and no significant drift occurred during measurements. Up-to-date calibration certification can be provided upon request. Full calibration details are provided in **Appendix C**.

Daytime temperatures during the survey were noted as between 15 - 17°C with wind speeds typically between 4 - 5m/s; deemed suitable for conducting environmental noise monitoring. Detailed meteorological information can be found in **Appendix D**.

The site, proposed noise source and NSR locations are shown in **Figure 1**.



Figure 1: Site, Source & NSR Locations - <https://google.co.uk/maps>

-  Site Boundary (Approx.)
-  Background Monitoring Location M1 (Approx)

Site Description

The site is located in the district of Spotland in the northwest of Rochdale on a roundabout connecting Spotland Road/Mellor Street to Edenfield Road and Rooley Moor Road. These are all busy 30mph roads with all vehicle types observed to use them. The majority of the surrounding area remains residential with notable sources of noise being Rochdale AFC ground approximately 300 metres to the west and Falinge Park High School with playing fields approximately 200 metres to the northeast.

Context and Subjective Noise Climate

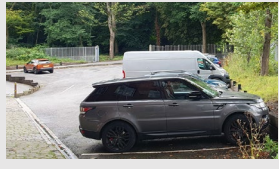
Noise Source	Description	Time of Observation	Photo
Surrounding Roads and Roundabout	Heavy traffic noise from busy roundabout with all vehicle types observed to use these roads	Constant during the site visits.	
Car Park	Cars were observed entering and leaving Spotland Bridge Mill Car Park.	Intermittent during site visits.	
Power Tools	Power tools and hammering were used in nearby units of Spotland Bridge Mill, notably Adam Windows.	Intermittent during site visits.	

Table 1: Subjective Summary of Noise Sources

Secondary sources were noted as passing pedestrians chatting, overhead aircraft and birdsong.

Non-Representative Noise Sources

During the survey, no noise events occurred which would be deemed as atypical of the site location.

Noise Sensitive Receptors

The nearest or most-affected Noise Sensitive Receptors (NSRs) were identified as the residential properties that surround the proposed Distillery and Gin Experience Area. The closest habitable room windows of the NSRs will be considered as a specific reception point in calculations.

3. Environmental Noise Survey Results

Measurement Results

Any future plant installations will serve the ground floor operations and therefore have the potential to operate at any time of the day. For example, chiller units or air conditioning systems.

The day and night-time background sound levels from measurement M1 are summarised below.

Measurement	Date(s)	Period	L _{Aeq,T}	L _{A90,T}
M1	28 th July 2023	Daytime (10:30 – 23:00) (Aggregate Period)	68	58
	28 th - 29 th July 2023	Night-time (23:00 – 07:00)	60	34
	29 th July 2023	Daytime (07:00 – 23:00)	68	55

	29 th – 30 th July 2023	Night-time (23:00 – 07:00)	62	39
	30 th July 2023	Daytime (07:30 – 23:00)	68	54
	30 th – 31 st July 2023	Night-time (23:00 – 07:00)	63	37
	31 st July 2023	Daytime (07:30 – 09:15)	69	59

Table 2: M1 Background Noise Survey Results

A full-time history of the survey data is shown in **Appendix E**.

For the derivation of a representative day and night-time background sound level, the sound level data from each period has been statistically analysed.

A graph of the statistical analysis for M1 daytime and night-time data is given below:

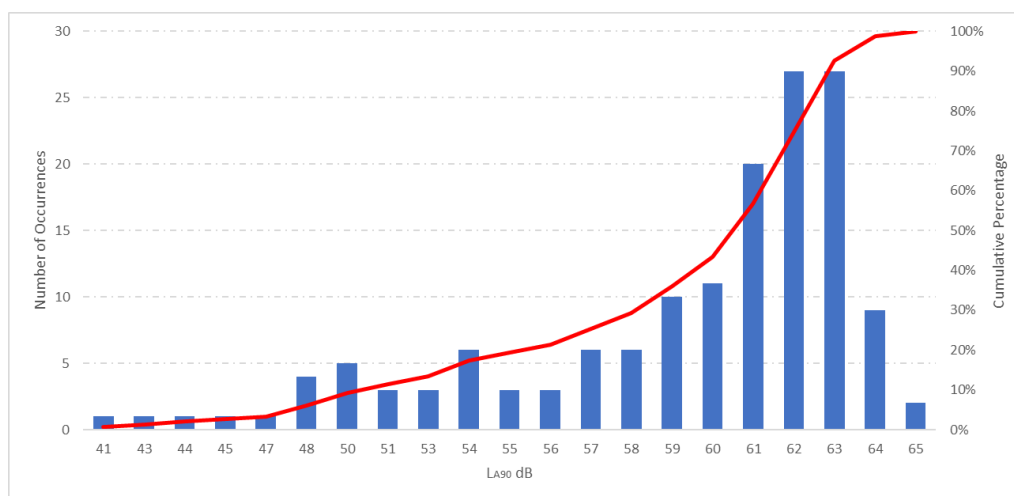


Figure 2: M1 Background Daytime Statistical Analysis

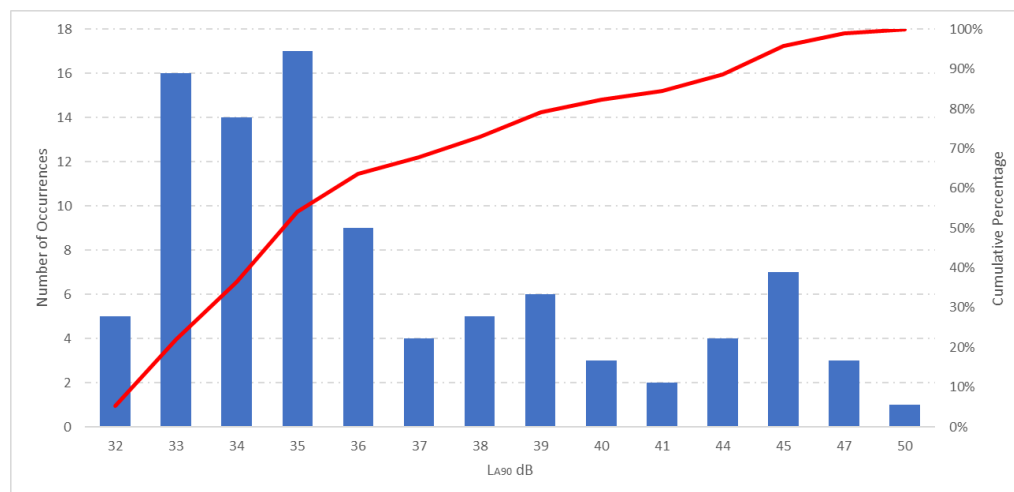


Figure 3: M1 Background Night-time Statistical Analysis

From the statistical analysis of the M1 measurement, **54dB LA90** has been selected as the representative background sound level for the daytime period and **33dB LA90** has been selected as the representative background sound level for the night-time period.

4. Rating Noise Limiting Level

Based on the background noise levels for the daytime and night-time periods, rating noise levels for any future external plant should not exceed **54dB** and **33dB** during the day and night respectively at a point 1m external to the nearest noise sensitive receptor window.

5. Sound Insulation to Residential Units

The guidance in Approved Document E (ADE) regarding commercial uses is simply that a higher standard of sound insulation may be required between spaces separating domestic and non-domestic purposes, and that the appropriate level of sound insulation required will depend on the noise generated in the non-domestic space.

For guidance, an improvement of +10dB compared with the normal residential sound insulation requirements might typically be suitable for general commercial use. A review of the proposals for the constructions separating the various spaces within the development may be required at a later stage. Such an assessment can be undertaken once the proposed plans have been confirmed and detailed construction proposals are available for review.

6. Conclusion

A Noise Impact Assessment has been undertaken at Spotland Bridge Mill, Spotland Road, Rochdale OL11 5BU, in relation to the proposed change of use to a Distillery and Gin Experience Area. The assessment has been undertaken to determine noise rating level limits for any future external plant installations.

Measurements of the background noise climate were undertaken from the 28th – 31st July 2023 at a position deemed representative of the identified Noise Sensitive Receptors (NSRs).

The nearest or most-affected Noise Sensitive Receptors (NSRs) were identified as the residential properties that surround the site. The closest habitable room windows of the NSRs have been used as specific reception points in calculations.

The daytime and night-time background noise levels for the area have been determined and a maximum noise rating level has been provided that noise levels from any future plant installations should not exceed at a point 1m external to the receptor.

7. Uncertainty

The background monitoring equipment is subject to a 1dB error margin, however, calibration before and after measurements allows the drift within the margin to be monitored and thus demonstrates that minimal drift occurred throughout the measurements.

Uncertainty can arise in the prediction of noise propagation from and around flat reflective surfaces, such as the surrounding structures present on site. This has been reduced to a minimum by utilising an acoustic modelling software that uses the validated method, ISO-9613-2, as described in BS4142.

APPENDIX A - Measurement Details

Measurement	Kit	Start Date	Start Time	End Date	End Time
M1	A3	28/07/2023	10:30	31/07/2023	09:15

Table 3: Measurement Dates



Figure 4: Site Location Measurement Pictures

APPENDIX B - Equipment Details

Kit	Equipment	Make	Model	Class	Serial Number
A3	Sound Meter	Svantek	971	1	41980
A3	Pre-Amp	Svantek	SV18	1	44331
A3	Microphone	ACO	7052E	1	60249
2	Calibrator	Svantek	SV33	1	83715

Table 4: Measurement Equipment Details

APPENDIX C - Calibration Details

Measurement	Calibrator Ref Level (dB)	Deviation Before (dB)	Deviation After (dB)
M1	113.8	0.37	0.29

Table 5: Calibration Details

APPENDIX D - Meteorology Details

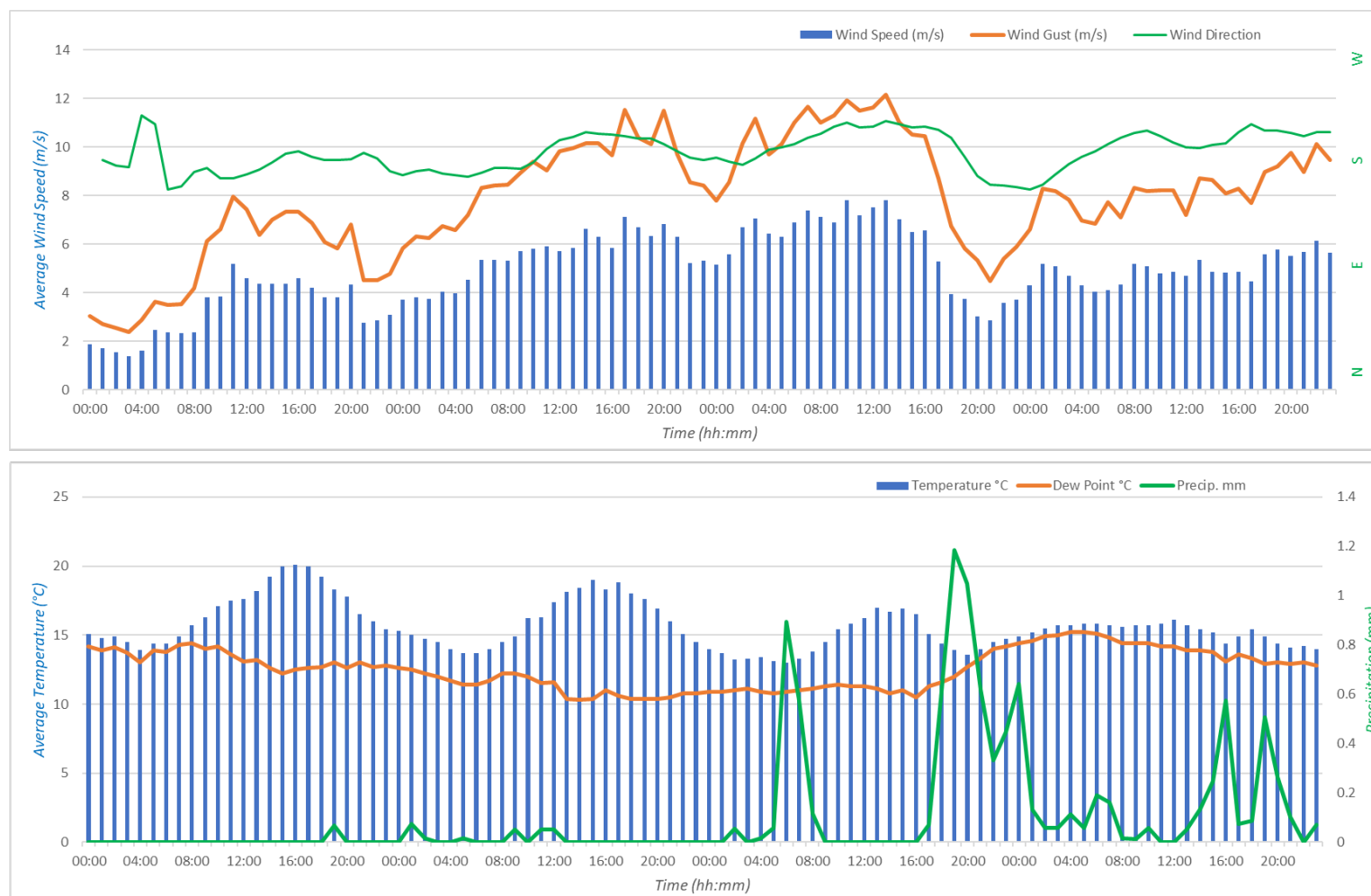


Figure 5: Meteorology Data - <https://www.visualcrossing.com/weather>

APPENDIX E - Noise Survey Results

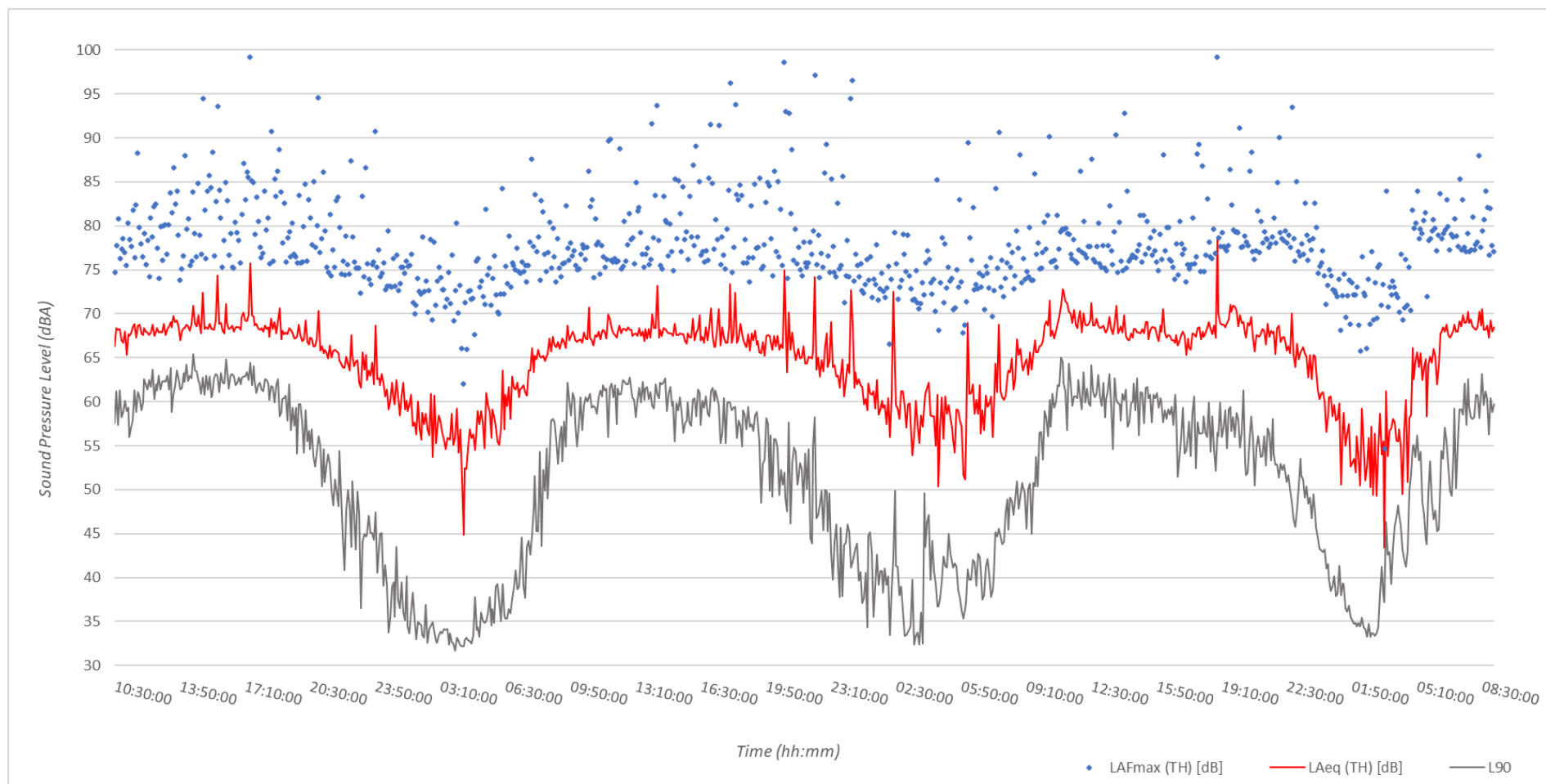


Figure 6: Measured Background Sound Levels Time History (M1): 28th – 31st July 2023

APPENDIX F - Site Plans

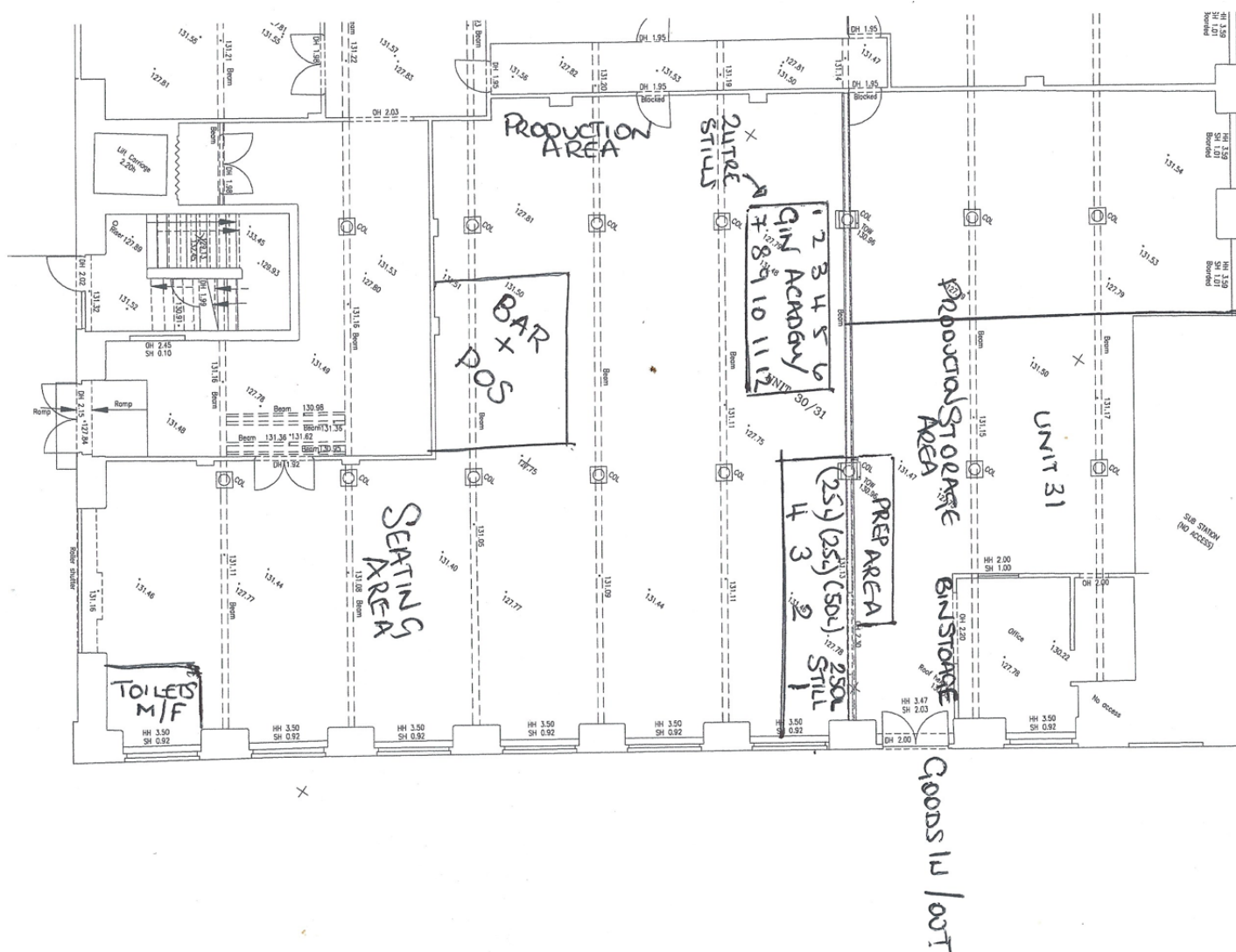


Figure 7: Site Plans Provided by client

APPENDIX G - Legislation, Policy & Guidance

Guidance for the assessment of noise affecting new residential development is given in the National Planning Policy Framework (NPPF). Section 15 of the NPPF states:

“174. 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...noise pollution.”

Section 185 further 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 impact 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.”*

Section 187 states:

“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.”

To avoid and mitigate adverse noise effects on health arising from and impacting new development, the NPPF makes reference to NPSE. The Noise Policy Statement for England (NPSE) was published in March 2010 and covers all forms of noise other than occupational noise.

The Noise Policy Statement for England (NPSE) states the following aims in paragraph 2.2.

NOEL – No Observed Effect Level.

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level.

This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level.

This is the level above which significant adverse effects on health and quality of life occur.

The NPSE does not define the SOAEL numerically, stating in paragraph 2.22:

"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the "NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."

There is no local or national guidance on how the three terms should be defined numerically, it is for the assessor to collate and interpret appropriate guidance on noise, such as may be found in British Standards, and correlate the guidance with the concepts of NOEL, LOAEL and SOAEL.

BS4142:2014+A1:2019

The common standard for the assessment of industrial and commercial sound is '**BS4142 – Methods for rating and assessing industrial and commercial sound**'. The industrial noise assessment method in BS4142 is based on the difference between the measured 'background sound level' (L_{A90}), and the 'Rating Level' of the industrial source, at a noise-sensitive location (NSR). BS4142:2014 states:

"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs."

An estimation of the impact of the specific sound can be obtained by the difference between the rating sound level and the background sound level whilst considering the following:

"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;"

BS4142 further states:

"The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a negligible impact, depending on the context."

Achievement of a *Low Impact* in accordance with BS4142 along with a contextual assessment can be deemed to correspond to '*NOEL – No Observed Effect Level*' in the NPSE.

BS8233:2014

BS8233:2014 - *Guidance on sound insulation and noise reduction for buildings* suggests indoor ambient noise levels for dwellings in Table 4, Section 7.7.2. These are summarised below.

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	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

BS8233 states that the guideline values given above are for 'noise without character', further stating:

"Noise has a specific character if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate."

Table 4 of BS8233 also has accompanying notes that were subject to additions in ProPG. The relevant notes with the additions of ProPG are given below.

"NOTE 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events."

"NOTE 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal L_{Aeq} target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved."

APPENDIX H - Acoustic Terminology

To aid the understanding of acoustic terminology and the relative difference between noise levels the following background information is provided.

We perceive sound when the ear detects fluctuations in air pressure (sound waves), which are then processed by the brain and perceived as sound. Humans can hear an incredibly wide range of sound intensities ranging from jet engines to fingertips lightly brushing against each other. This range is quantified using a logarithmic scale called the decibel scale (dB). The comfortable range of the decibel scale typically ranges from 0dB (the threshold of hearing) to around 140 dB. Here are some examples of common environments and their typical noise levels.

Noise Level	Environment
0 dB(A)	Threshold of hearing
20 to 30 dB(A)	Quiet bedroom at night
30 to 40 dB(A)	Living room during the day
40 to 50 dB(A)	Typical office
50 to 60 dB(A)	Inside a moving car
60 to 70 dB(A)	Typical high street
100 to 110 dB(A)	Fire alarm at 1 metre away
140 dB(A)	Threshold of pain

Terminology

dB (decibel) – A unit used to quantify the pressure level of sound. Defined as 20 times the logarithm of the ratio between the root-mean-square pressure of a given sound field and a reference pressure level (2×10^{-5} Pa – threshold of hearing).

$L_{Aeq, T}$ – The equivalent continuous sound pressure level over a stated period. It quantifies a fluctuating sound level over a given period as the equivalent continuous sound level over which the same amount of acoustic energy is contained over. This is A-weighted in order to assess human perception.

L_{A90} – The sound level exceeded 90% of the time. Typically used to describe background noise the L_{90} is regarded as the ‘average minimum level’ and quantifies the common sound level of a fluctuating sound field i.e. the sound level that occurs 90% of the time. Alternatively, L_{10} describes the sound level exceeded 10% of the time and therefore quantifies the ‘average maximum level’ of sound which is often used during the calculation of road traffic noise.

A-Weighting – A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.

R_w – The Weighted Sound Reduction Index (R_w) is a number used to rate the effectiveness of a soundproofing system or material.