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**PURBANI RESTAURANT
HIGH STREET, BOTLEY
PLANT NOISE ASSESSMENT**

Technical Report: R9434-1 Rev 2

Date: 22nd September 2022

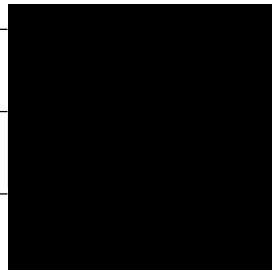
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Project Title: Purbani Restaurant, Botley – Plant Noise Assessment

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1.0 INTRODUCTION

- 1.1 24 Acoustics Ltd has been instructed by Purbani Botley Restaurants Ltd to undertake an assessment of noise from a proposed kitchen supply fan at the Purbani Restaurant, 2 High Street, Botley.
- 1.2 It is proposed to expand the restaurant's existing kitchen into a neighbouring unoccupied ground floor flat. The kitchen's existing supply and extract fans will be retained with a new through wall supply fan installed at ground floor level of the proposed kitchen extension. The extension will primarily be used for food preparation and storage.
- 1.3 This report presents the results of the assessment, following site visits and a background noise survey undertaken between 17th and 21st March 2022.
- 1.4 All sound pressure levels quoted in this report are in dB relative to 20 μ Pa. All sound power levels quoted in this report are in dB relative to 10⁻¹² Watts. A glossary of the acoustic terminology used in this report is provided in Appendix A.

2.0 SITE DESCRIPTION

- 2.1 Planning permission is sought to expand the restaurant's kitchen into a disused flat and install a new kitchen supply fan, to be located at the rear of the property.
- 2.2 The nearest residential properties to the proposed fan are described below and shown in Figure 1:
 - Receptor 1: 3 Winchester Street, nearest window located approximately 7m to the north;
 - Receptor 2: First floor flat, approximately 2m above the proposed kitchen supply fan.
- 2.3 The proposed kitchen supply fan will operate during daytime periods (12:00 to 22:30 hours) only. Therefore, this assessment will consider the specific noise level against the measured daytime (07:00 to 19:00 hours) and evening (19:00 to 22:30 hours) background noise levels.

- 2.4 The ground floor flat proposed for kitchen extension use is located adjacent to the current kitchen area. The proposals include new access doorways within the building to ensure stock retrieval can be carried out internally. This will limit external activity noise from stock transportation. Increased storage space can also reduce the frequency of current deliveries (i.e. larger amounts of stock can be stored for longer). Other existing operations will remain unchanged.
- 2.5 An aerial view of the site and the measurement location is shown in Figure 1. The proposed plant location is shown in Figure 2.

3.0 RELEVANT CRITERIA

National Planning Policy Framework and Noise Policy Statement for England

- 3.1 Paragraph 185 of the National Planning Policy Framework (NPPF) [Reference 1] states that planning policies and decisions 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.
- 3.2 The NPPF also refers to the Noise Policy Statement for England (NPSE) [Reference 2] which is intended to apply to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise. The NPSE sets out the Government's long-term vision to 'promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development' which is supported by the following aims.
- Avoid significant adverse impacts on health and quality of life;
 - Mitigate and minimise adverse impacts on health and quality of life.
- 3.3 The NPSE defines the concept of a 'significant observed adverse effect level' (SOAEL) as 'the level above which significant adverse effects on health and quality of life occur'. The following guidance is provided within the NPSE:

"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."

- 3.4 The NPPF and NPSE documents do not refer to specific noise criteria. When considering the impact of noise from new plant 24 Acoustics considers that the spirit of the requirements of the NPPF and NPSE will be complied with if criteria from British Standard 4142:2014 [Reference 3] are adopted.

BS 4142:2014 Methods for Rating Industrial and Commercial Sound

- 3.5 BS 4142:2014+A1:2019 provides a method for rating the effects of industrial and commercial sound on residential receptors.
- 3.6 The standard advocates a comparison between the representative measured L_{A90} background noise level and L_{Aeq} noise level from the source being considered. For rating purposes if the noise source is tonal, intermittent or otherwise distinctive in character, a rating correction should be applied.
- 3.7 The standard states that a difference between the rating level and the background level of around +10 dBA is an indication of a significant adverse impact, depending on the context and a difference of around +5 dBA is likely to be an indication of an adverse impact, also depending on the context. Where the rating level does not exceed the background noise level, this is an indication of the specific sound source having a low impact (depending upon the context).
- 3.8 BS 4142 requires the noise impact to be assessed depending on the context. In relation to situations where background noise levels are low, the standard states "Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night."

Local Authority Correspondence

- 3.9 24 Acoustics has been unable to initiate contact with Eastleigh Borough Council's Pollution Control Department to discuss the latest proposals. However, comments have been received from Eastleigh Borough Council's Senior Pollution Control Officer Neil Scott (dated: 24th August 2022) relating to previous proposals and associated noise assessment for the site (reference R9434-1 Rev 1). Key comments are summarised below:
- Consideration of odour;
 - Specification of the proposed plant;
 - Consideration of background noise levels during evening operational periods;
 - Breakout noise from the relocated kitchen;
 - Consideration of sound insulation to above flat.
- 3.10 Previous proposals included a new kitchen supply and extract fan. Current proposals will now utilise the property's existing kitchen supply and extract system and install a small supply fan only to the kitchen extension area. Therefore, current long standing odour control measures will not be affected and have not been considered further.
- 3.11 Additionally, existing operations in terms of scale will not be affected (i.e. low noise activity to the kitchen extension – food prep/storage; cooking activity will occur in the existing kitchen area) and breakout from the existing kitchen space and proposed kitchen extension will not be significant in noise terms.
- 3.12 Based on the above, this report has addressed the relevant comments in relation to the new proposals as shown below:
- Accurate specification of the proposed plant;
 - Assessment of proposed plant noise during evening operational periods;
 - Consideration of sound insulation to above flat.

Sound Insulation Between Residential and Retail Use

- 3.13 Approved Document E [Reference 4] of the Building Regulations requires that compliance with the sound insulation requirements be demonstrated by Pre-Completion Testing (PCT).

- 3.14 It is recommended that party floors separating residential properties from the kitchen extension be specified to achieve an enhanced sound insulation performance of 55 dB $D_{nT,w}$.

Summary

- 3.15 Based on the above guidance, it is considered appropriate to target a BS 4142 plant noise rating level at least 5 dB below the typical background noise level at the nearest noise sensitive properties during daytime and evening operational hours.
- 3.16 Consideration will also be given to the sound insulation achieved between the ground floor kitchen extension and first floor flat with outline recommendations provided to minimise the risk of noise transfer.

4.0 NOISE MEASUREMENTS

Background Noise Survey

- 4.1 A noise survey was undertaken between 17th and 21st March 2022 to assess the existing background noise levels. The following equipment was used:
- Rion precision sound level meter Type NL-31;
 - Brüel & Kjær acoustic calibrator Type 4231.
- 4.2 The noise monitoring equipment was located to the rear of the property at a height of 4m above local grade level. This location is considered representative of the noise climate at nearby residential properties and is shown in Figure 1.
- 4.3 Measurements were undertaken in samples of 5 minutes in terms of the overall free-field A-weighted L_{eq} , L_{90} and $L_{max,f}$ noise levels. Measurements were made in accordance with BS 7445:1991 "Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use" [Reference 5].
- 4.4 The instrumentations' calibration was checked before and after the survey in accordance with the manufacturer's instructions. No significant drift in calibration was recorded. Calibration of 24 Acoustics' equipment is traceable to National Standards.
- 4.5 The instrumentation was fitted with environmental weather shields during the surveys. Weather conditions during the surveys were fine and dry.
- 4.6 The results of the background noise surveys are shown graphically in Appendix B and are summarised in Table 1 for the daytime and evening operational hours.

Date (March 2022)	Typical Background Noise Level	
	Daytime Operational Period dB LA90, 1 hour (12:00 - 19:00)	Evening Operational Period dB LA90, 1 hour (19:00 - 22:30)
Thursday 17th	49	46
Friday 18th	48	48
Saturday 19th	51	49
Sunday 20th	49	44
Monday 21st	50	-
Average	49	47

Table 1: Summary of Measured Noise Levels – Operational Hours

- 4.7 Following a consultation response from Eastleigh Borough Council's Senior Pollution Control Officer Neil Scott (described in Section 3), typical background noise levels of 44 dB LA90 1 hour during the worst-case weekend period of operation (19:00 to 22:30 hours) have been determined from the measurement results.
- 4.8 24 Acoustics determines the typical background noise level to be the average minus one standard deviation.
- 4.9 The dominant noise sources in the area are local road traffic. Periods of plant noise were noted during the survey, comprising extract systems from a neighbouring public house and café. The Purbani restaurant's existing supply and extract system was in operation during the survey, although it was noted during site investigations that noise from the extract and supply system was not noticeable at the site boundaries or measurement location.

5.0 PLANT NOISE ASSESSMENT

Plant Noise Data

- 5.1 It is proposed to install a single Vent Axia kitchen supply fan (single phase plate mounted fan, stock ref VSP35514) to the location shown in Figures 1 and 2 at ground floor level.
- 5.2 The manufacturer's noise data for the proposed supply fan is shown in Table 2.

Extract Fan: Vent Axia VSP25012 Manufacturer's Stated Sound Power Level (dB) Octave Band Centre Frequency (Hz)								SPL dBA at 3m
63	125	250	500	1k	2k	4k	8k	
73	79	77	72	68	67	63	57	50

Table 2: Manufacturer's Noise Data

5.3 Calculations have been undertaken to determine the level of noise from the proposed supply fan at the nearest noise sensitive windows including corrections for distance, reflections, directivity and screening provided by the first-floor balcony access walkway. Resultant noise levels are shown below:

- Receptor 1: 28 dB L_{Aeq} 1 hour;
- Receptor 2: 39 dB L_{Aeq} 1 hour.

5.4 Following consultation with the local Environmental Health Department, a BS 4142 assessment of the worse case evening period of operation, utilising the lowest measured typical background noise levels (described in section 4.7) has been undertaken and is shown in the following section.

BS 4142:2014 Assessment

5.5 A BS 4142 assessment for the proposed plant has been undertaken and is shown in Table 3. The proposed supply fan is not considered to contain tonal or other distinctive characteristics.

BS:4142 Plant Noise Assessment (Daytime Operation 12:00 to 19:00 hours)		
	Receptor 1 3 Winchester Road	Receptor 2 First Floor Flat
Representative Background Noise Level	49 dB L_{A90} , 1 hour	49 dB L_{A90} , 1 hour
Specific Source Noise Level	28 dB L_{Aeq} 1 hour	39 dB L_{Aeq} 1 hour
Rating Correction	0 dB	0 dB
Rating Noise Level	28 dBA	39 dBA
BS 4142 Assessment Level	-21 dBA	-10 dBA
BS:4142 Plant Noise Assessment (Worse Case Evening Operation 19:00 to 22:30 hours)		
	Receptor 1 3 Winchester Road	Receptor 2 First Floor Flat
Representative Background Noise Level	44 dB L_{A90} , 1 hour	44 dB L_{A90} , 1 hour
Specific Source Noise Level	28 dB L_{Aeq} 1 hour	39 dB L_{Aeq} 1 hour
Rating Correction	0 dB	0 dB
Rating Noise Level	28 dBA	39 dBA
BS 4142 Assessment Level	-16 dBA	-5 dBA

Table 3: BS 4142 Assessment

- 5.6 Table 3 shows that the BS 4142 rating levels at the receptor locations will be at least 5 dB lower than the typical background noise level during proposed daytime and evening operational periods. This is a 'low' impact under BS 4142 and is acceptable.

Sound Insulation – Kitchen Extension to First Floor Flat

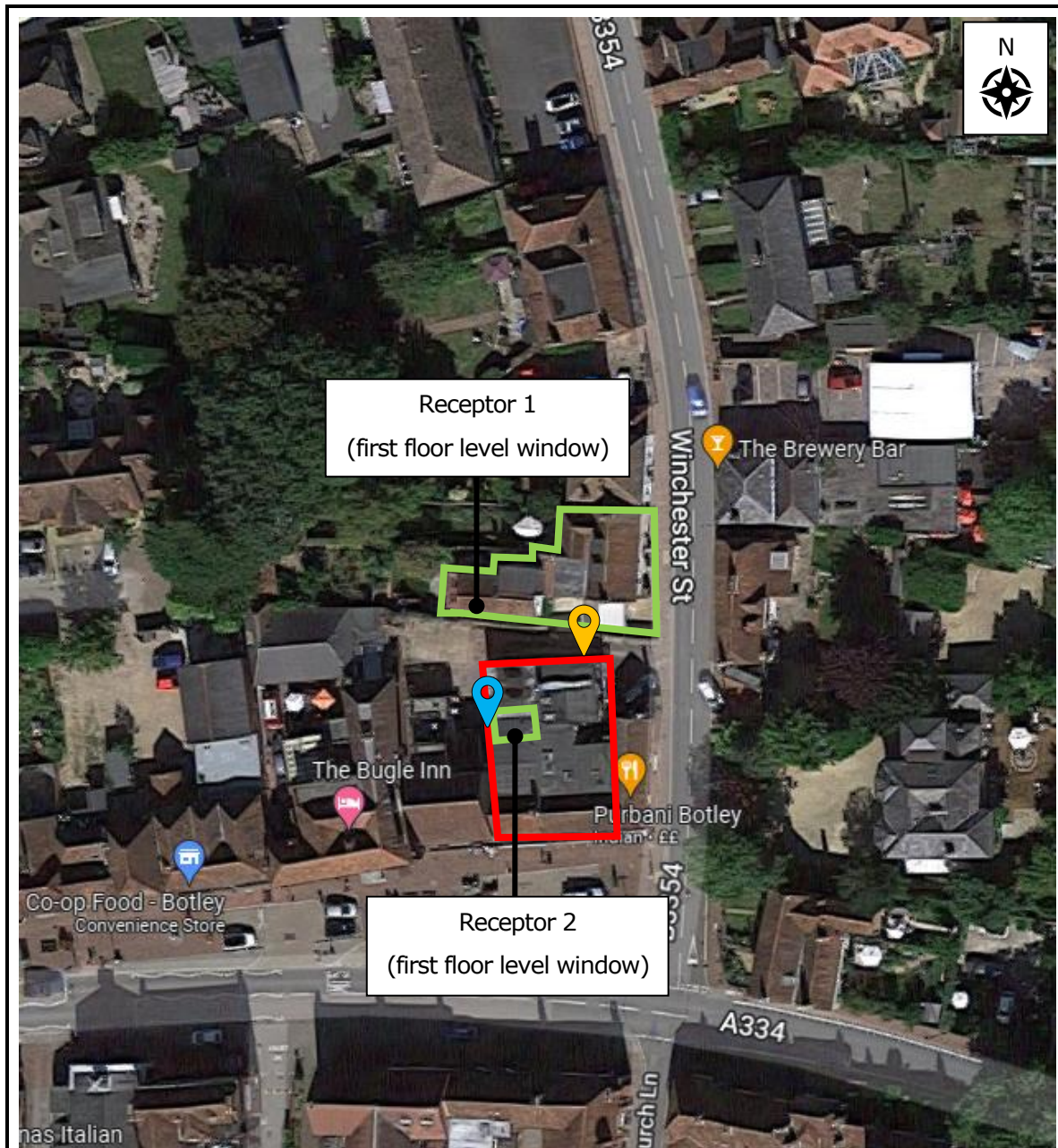
- 5.7 The party floor construction between the kitchen extension and first floor flat is not currently known. Therefore, it is recommended to undertake an investigation and preliminary airborne sound insulation tests of the separating floor to determine the current sound insulation performance.
- 5.8 If the existing floor's sound insulation performance is found to be below the recommended performance outlined in Section 3, measures shall be undertaken to enhance the floor's sound insulation performance (i.e. isolation of the ceiling, addition of mineral wool insulation, additional mass layers). This can be applied via condition, if required, with suitable condition wording available on request.

6.0 CONCLUSIONS

- 6.1 Purbani Botley Restaurants Ltd has instructed 24 Acoustics Ltd to undertake a noise impact assessment for new kitchen supply fan at the Purbani Restaurant in Botley.
- 6.2 An environmental noise survey has been undertaken to determine the existing background noise levels representative of nearby residential properties.
- 6.3 Calculations have been undertaken, based on manufacturer's noise data, to determine the plant noise levels at the nearest noise sensitive receptors.
- 6.4 The assessment demonstrates that noise from proposed new plant at the most affected residential windows will be at least 5 dBA below the measured background noise levels and is 'low' impact when assessed in accordance with the guidance of BS 4142. Therefore, noise from the proposed new plant is acceptable.
- 6.5 Additionally, consideration has been given to sound insulation between the proposed kitchen extension and flat above, with recommendations provided for a sound insulation testing regime and subsequent assessment.

REFERENCES

1. Department for Communities and Local Government. National Planning Policy Framework, Revised July 2021.
2. DEFRA, Noise Policy Statement for England, March 2010.
3. British Standards Institution. British Standard 4142:2014+A1:2019. Methods for Rating Industrial and Commercial Sound, 2014.
4. Approved Document E "Resistance to the Passage of Sound" 2003 of the Building Regulations 2010.
5. British Standards Institution. British Standard 7445:1991 Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use, 1991.



Measurement Location



Supply Fan Location (ground floor level)

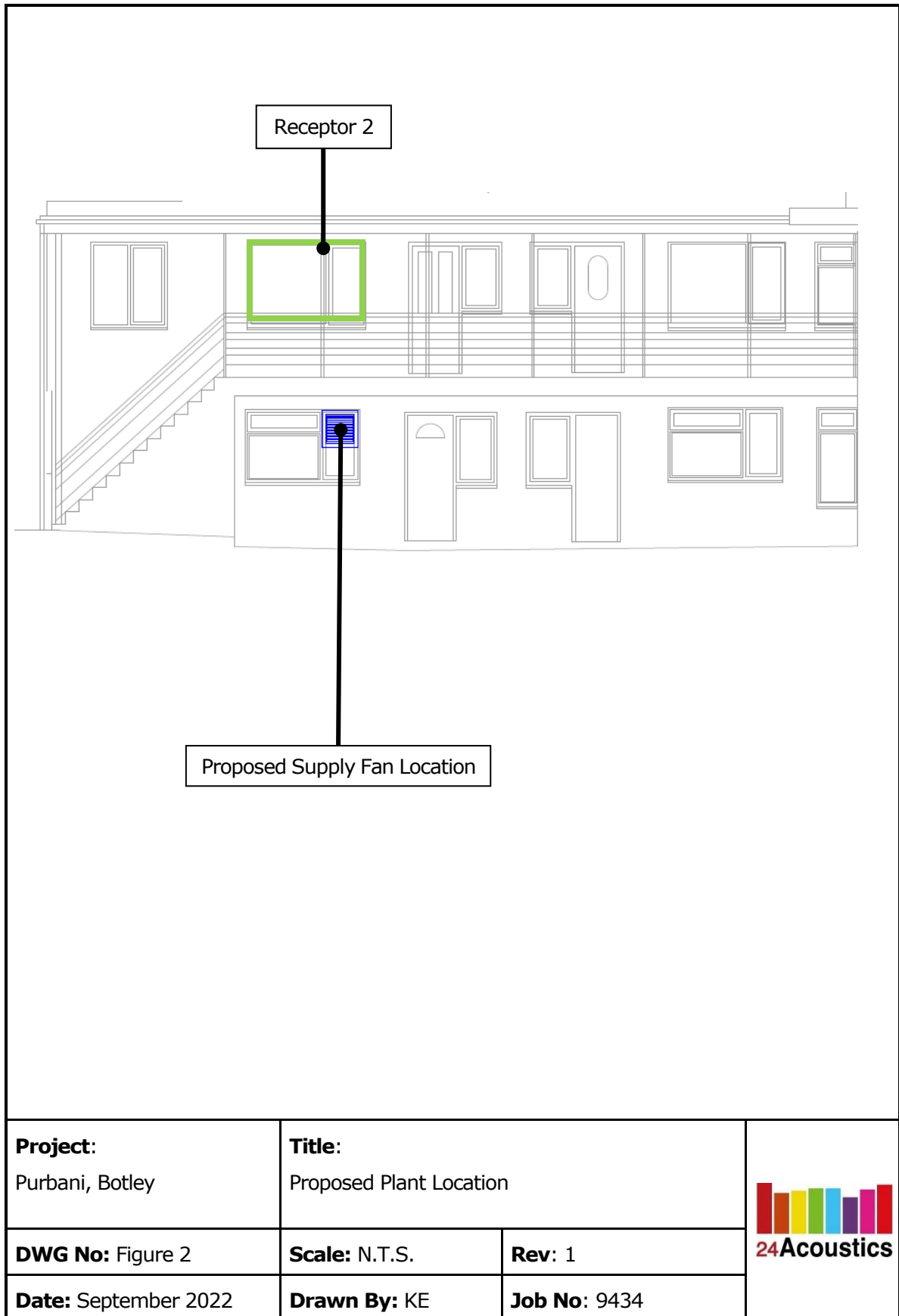
Project:

Purbani, Botley

Title:

Aerial view, survey location, and nearest receptors.

DWG No: Figure 1**Scale:** N.T.S.**Rev:** 1**Date:** September 2022**Drawn By:** KE**Job No:** 9434



APPENDIX A – ACOUSTIC TERMINOLOGY

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dBA weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dB is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dB. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dB corresponds to a doubling/ halving in perceived loudness.

External noise levels are rarely steady, but rise and fall according to activities within an area. In attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

i) The L_{Amax} noise level

This is the maximum noise level recorded over the measurement period.

ii) The L_{Aeq} noise level

This is "equivalent continuous A-weighted sound pressure level, in decibels" and is defined in British Standard BS 7445 as the "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".

It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

iii) The L_{A10} noise level

This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

iv) The L_{A90} noise level

This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.

APPENDIX B – AMBIENT NOISE SURVEY RESULTS

