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**10 SHEEN COMMON DRIVE  
RICHMOND  
PLANT NOISE ASSESSMENT**

Technical Report: R10349-1 Rev 1

Date: 29th April 2024




For: Michael Jones Architects  
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## 24 Acoustics Document Control Sheet

**Project Title:** 10 Sheen Common Drive – Plant Noise Assessment

**Report Ref:** R10349-1 Rev 1

**Date:** 29th April 2024

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For and on behalf of 24 Acoustics Ltd				

## Document Status and Approval Schedule

Revision	Description	Prepared By	Reviewed by	Approved By
0	Approved for issue	Kiel Edwards	Chris McConnell	Stephen Gosling
1	Layout Update	Kiel Edwards	Chris McConnell	Stephen Gosling

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## 1.0 INTRODUCTION

- 1.1 24 Acoustics Ltd has been instructed by Michael Jones Architects to undertake a noise assessment of proposed condensing plant at 10 Sheen Common Drive, Richmond.
- 1.2 This report presents the results of the assessment, following site visits and a background noise survey undertaken between 23rd and 27th November 2023.
- 1.3 All sound pressure levels quoted in this report are in dB relative to 20  $\mu$ Pa. A glossary of the acoustic terminology used in this report is provided in Appendix A.

## 2.0 SITE DESCRIPTION

- 2.1 It is proposed to refurbish the property, comprising internal remodelling works and the installation of mechanical ventilation (MVHR) and air conditioning. Planning permission is sought to install two new air source heat pump units to the rear garden of the property, within a small enclosure (providing visual screening only).
- 2.2 The nearest residential properties to the proposed condensers are the neighbouring buildings on Sheen Common Drive, described below:
- 8 Sheen Common Drive, approximately 39m northwest of the proposed plant location;
  - 12 Sheen Common Drive, approximately 39m west of the proposed plant location.
- 2.3 It is understood that the condenser units will operate on demand. Therefore, this assessment will consider the specific noise level during daytime (07:00 to 19:00 hours), evening (19:00 to 23:00 hours) and night-time (23:00 to 07:00 hours) periods.
- 2.4 An aerial view of the site is shown in Figure 1 with the proposed plant location shown in Figure 2.

## 3.0 RELEVANT CRITERIA

### National Planning Policy Framework and Noise Policy Statement for England

- 3.1 The National Planning Policy Framework (NPPF) [Reference 1] states that planning policies and decisions should aim to:

- 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 quality of life.
- 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'.

3.4 The Planning Practice Guidance (PPG) [Reference 3] is written to support the NPPF with more specific planning guidance. The PPG reflects the NPSE and states 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 also states that opportunities should be taken, where practicable, to achieve improvements to the acoustic environment. The NPPG states that noise can over-ride other planning concerns but should not be considered in isolation from the other economic, social and environmental dimensions of the proposed development.

3.5 The PPG expands upon the concept of SOAEL (together with Lowest Observable Adverse Effect Level, LOAEL and No Observed Effect Level, NOEL) as introduced in the NPSE and provides a table of noise exposure hierarchy for use in noise impact assessments in the planning system.

3.6 The documents described above 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 4] are adopted.

### BS 4142: 2014+A1:2019 Methods for Rating Industrial and Commercial Sound

- 3.7 BS 4142:2014 provides a method for rating the effects of industrial and commercial sound on residential areas. The standard advocates a comparison between the typical 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 of up to 15 dBA is applied.
- 3.8 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 again 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).

### Local Authority Requirements

- 3.9 Richmond Borough Council's Supplementary Planning Documents and Guidance includes the document "Development Control for Noise Generating and Noise Sensitive Development", which states that BS 4142 assessment levels that are equal to or below background noise levels "may be acceptable from a noise perspective but will be more context dependant". BS 4142 assessment levels of up to 5 dBA above background noise levels are "less likely to be acceptable from a noise perspective and will be context dependant".
- 3.10 The document also recognises that internal noise levels in nearby dwellings are also necessary to consider in some cases, e.g. for steady continuous noise without specific character internal noise levels from BS 8233: 2014 may be relevant.
- 3.11 Based on the requirements of Richmond Borough Council and BS 4142, a plant noise level equal to or below the typical background noise level will be targeted at the nearest noise sensitive façades. Consideration of internal noise levels due to any proposed plant should also be considered.

## 4.0 NOISE MEASUREMENTS

### Background Noise Measurements

4.1 Measurements were undertaken between 23rd and 27th November 2023 to assess the existing background noise levels in the area, using the following equipment:

- Rion precision sound level meter Type NL-32;
- Norsonic acoustic calibrator Type 1251.

4.2 The noise monitoring equipment was located to the rear of the property, adjacent to the neighbouring receptor locations, at a height of 2m above local grade level in free field conditions. This location is representative of the noise climate at nearby residential properties.

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 variable with periods of high wind speeds and rainfall. Measurements affected by adverse meteorological conditions have been removed from the assessment.

4.6 Construction activities were ongoing at a neighbouring property during the measurements. Periods affected by construction noise have been removed from the analysis.

4.7 Measurement results are shown graphically in Appendix B and are summarised in Table 1.

<b>Typical Measured Background Noise Level</b>		
<b>Daytime</b> <b>dB LA90,1 hour</b> <b>(07:00 - 19:00)</b>	<b>Evening</b> <b>dB LA90,1 hour</b> <b>(19:00 - 23:00)</b>	<b>Night-Time</b> <b>dB LA90,15 min</b> <b>(23:00 - 07:00)</b>
41	41	33

**Table 1:** Summary of Measured Noise Levels.

- 4.8 24 Acoustics determines the typical background noise level to be the average minus one standard deviation.

## 5.0 PLANT NOISE ASSESSMENT

### Plant Noise Data

- 5.1 It is proposed to install two Mitsubishi condensing units (model: PUZ-HWM140VHA(-BS)) to the location shown in Figure 2. The units will be housed within an enclosure, providing visual screening only.
- 5.2 An MVHR unit is proposed at second floor level, with atmospheric terminations to the northern façade. Noise from the MVHR unit will be adequately controlled via the installation of silencers as per the manufacturer's instruction. Therefore, noise from the proposed MVHR unit is not considered further.
- 5.3 The manufacturer's sound pressure level data for the proposed condensing units has been provided and is shown in Table 2.

Unit Make/Model	Sound Pressure Level (dB) at 1m Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Mitsubishi PUZ-HWM140VHA(-BS)	57	57	54	51	48	43	40	35	53

**Table 2:** Manufacturer's Sound Pressure Level Data at 1m.

- 5.4 Calculations have been undertaken to determine the level of noise from the proposed plant at the nearest noise sensitive windows including corrections for distance, reflections and number of units. Calculations indicate that noise from the proposed new plant will be in the order of 27 dB  $L_{Aeq,T}$  at the receptor locations.

### BS 4142:2014 Assessment

- 5.5 A BS 4142 assessment for the proposed plant units has been undertaken and is shown in Table 3. The proposed condenser units are not considered to contain tonal or other distinctive characteristics. Any potential intermittent noise characteristics from the proposed units are not expected to be readily distinctive against the prevailing ambient noise levels.



	<b>Receptor Locations</b> <b>8 and 12 Sheen Common Drive</b>		
	<b>Daytime</b>	<b>Evening</b>	<b>Night-Time</b>
<b>Representative Background Noise Level</b>	41 dB L <sub>A90</sub> , 1 hour	41 dB L <sub>A90</sub> , 1 hour	33 dB L <sub>A90</sub> , 15 min
<b>Specific Source Noise Level</b>	27 dB L <sub>Aeq</sub> 1 hour	27 dB L <sub>Aeq</sub> 1 hour	27 dB L <sub>Aeq</sub> 15 min
<b>Character Correction</b>	0 dB	0 dB	0 dB
<b>Rating Noise Level</b>	27 dBA	27 dBA	27 dBA
<b>BS 4142 Assessment Level</b>	-14 dBA	-14 dBA	-6 dBA

**Table 3:** BS 4142 Assessments at the receptor locations.

- 5.6 Table 3 demonstrates that the BS 4142 rating levels at the receptor locations will be lower than the background noise level during daytime, evening and night-time periods. This is a low noise impact based on Richmond Borough Council's guidance and BS 4142: 2014 and is, therefore, acceptable.

## 6.0 CONCLUSIONS


- 6.1 Michael Jones Architects has instructed 24 Acoustics Ltd to undertake a noise assessment for new condensing units at 10 Sheen Common Drive, Richmond.
- 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 for the proposed unit selections, to determine the plant noise levels at the nearest noise sensitive windows.
- 6.4 The assessment demonstrates that noise from proposed new condensing plant at the nearest residential windows will be below the typical background noise level during all periods and is in line with the guidance of Richmond Borough Council. Therefore, noise from the proposed new plant is acceptable.

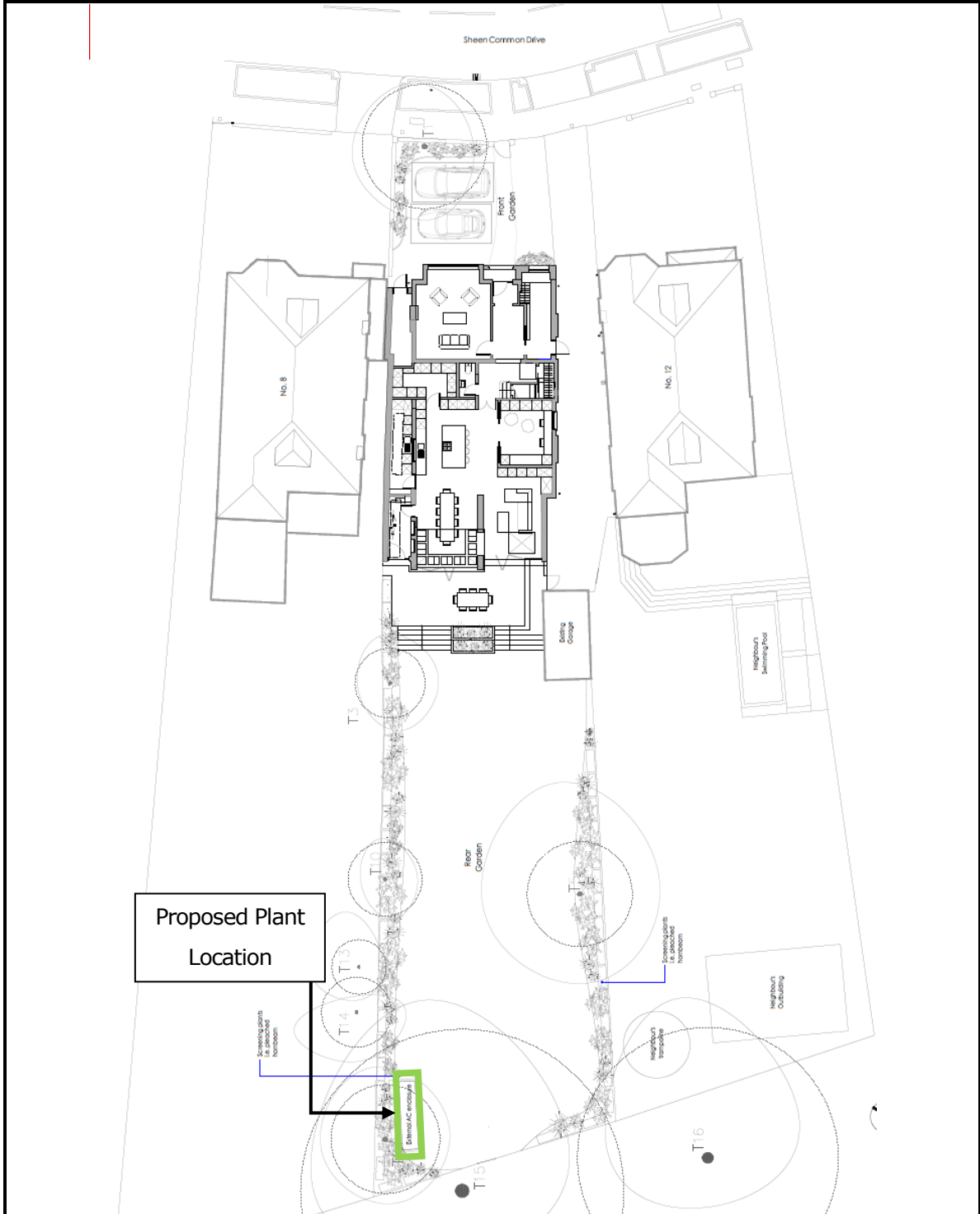
## REFERENCES


1. Department for Levelling Up, Housing & Communities. National Planning Policy Framework, 2023.
2. DEFRA, Noise Policy Statement for England, March 2010.
3. British Standards Institution. BS 4142: 2014+A1:2019. Methods for Rating Industrial and Commercial Sound, 2014.
4. 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

<b>Project:</b> 10 Sheen Common Drive, Richmond		<b>Title:</b> Aerial view, survey location, and nearest sensitive receptors.		
<b>DWG No:</b> Figure 1		<b>Scale:</b> N.T.S.	<b>Rev:</b> 0	
<b>Date:</b> April 2024		<b>Drawn By:</b> KE	<b>Job No:</b> 10349	



<p><b>Project:</b> 10 Sheen Common Drive, Richmond</p>	<p><b>Title:</b> Proposed Plant location.</p>		
<p><b>DWG No:</b> Figure 2</p>	<p><b>Scale:</b> N.T.S.</p>	<p><b>Rev:</b> 1</p>	
<p><b>Date:</b> April 2024</p>	<p><b>Drawn By:</b> KE</p>	<p><b>Job No:</b> 10349</p>	

## 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

