



T: 02381 555 000
E: info@24acoustics.co.uk

78 NEW OXFORD STREET

LONDON




PLANT NOISE ASSESSMENT

Technical Report: R9763-1 Rev 1

Date: 21st August 2024

For: Fairgate Estates Ltd C/O Levy Real Estate LLP
Heddon House
149-151 Regent Street
London
W1B 4JD

24 Acoustics Document Control Sheet**Project Title:** 78 New Oxford Street, London – Plant Noise Assessment**Report Ref:** R9763-1 Rev 1**Date:** 21st August 2024

	Name	Position	Signature	Date
Prepared by	Miles Hodge BSc (Hons) AMIOA	Consultant		21/08/2024
Reviewed by	Neil McLeod BA (Hons) MIOA	Principal Consultant		21/08/2024
Approved by	Stephen Gosling BEng MIOA	Principal Consultant		21/08/2024
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	Miles Hodge	Stephen Gosling	Stephen Gosling
1	Minor Amendments	Miles Hodge	Neil McLeod	Stephen Gosling

DISCLAIMER

This report was completed by 24 Acoustics Ltd on the basis of a defined programme of work and terms and conditions agreed with the Client. The report has been prepared with all reasonable skill, care and diligence within the terms of the Contract with the Client and taking into account the project objectives, the agreed scope of works, prevailing site conditions and the degree of resources allocated to the project.

24 Acoustics Ltd accepts no responsibility whatsoever, following the issue of the report, for any matters arising outside the agreed scope of the works.

This report is issued in confidence to the Client and 24 Acoustics Ltd has no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies upon the report at their own risk.

Unless specifically assigned or transferred within the terms of the agreement, 24 Acoustics Ltd retains all copyright and other intellectual property rights, on and over the report and its contents.

© 24 Acoustics Ltd 2024

CONTENTS	PAGE
1.0 INTRODUCTION	4
2.0 SITE DESCRIPTION	4
3.0 CRITERIA	4
4.0 ASSESSMENT METHODOLOGY	6
5.0 ENVIRONMENTAL NOISE SURVEY	6
6.0 PLANT NOISE ASSESSMENT	8
7.0 CONCLUSIONS	9
REFERENCES	10
APPENDIX A – ACOUSTIC TERMINOLOGY	11
APPENDIX B – NOISE SURVEY RESULTS	14

1.0 INTRODUCTION

- 1.1 24 Acoustics Ltd has been instructed by Levy Real Estate LLP on behalf of Fairgate Estates Ltd to undertake a noise assessment of replacement plant at 78 New Oxford Street, London.
- 1.2 This report presents the results of the assessment following site visits and environmental noise measurements undertaken between 19th to 25th October 2022.
- 1.3 All sound pressure levels quoted in this report are in dB relative to 20 µPa. A glossary of the acoustic terminology used in this report is provided in Appendix A.

2.0 SITE DESCRIPTION

- 2.1 78 New Oxford Street is an eight-storey building located on the corner of New Oxford Street (A40) and Dyott Street. The ground floor is currently occupied by a retail unit with offices on upper floors.
- 2.2 Figure 1 shows the existing site layout.
- 2.3 It is proposed to replace the existing building services plant servicing the offices. It is proposed to install the replacement plant (comprising 14 condenser units) on the roof of the building, in place of the existing equipment as shown in Figure 2.
- 2.4 The nearest residential properties are at 3 Bloomsbury Street to the east and Pamel House on Streatham Street to the north, as shown in Figure 1.
- 2.5 It is understood that the proposed condensers will operate on demand as needed.

3.0 CRITERIA

Local Authority Guidance

- 3.1 Camden Council's Local Plan (2017) [Reference 1] provides guidance on assessing noise from plant and machinery with reference to BS 4142 and displays plant noise Rating Levels in Table C of Appendix 3, reproduced in Table 1.

Existing Noise Sensitive Receptor	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAEL (Red)
Dwellings	Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade)	Day	'Rating level' 10dB* below background	'Rating level' between 9dB below and 5dB above background	'Rating level' greater than 5dB above background
Dwellings	Outside bedroom window (façade)	Night	'Rating level' 10dB* below background and no events exceeding 57dB _{L_{max}}	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88 dB L _{max}	'Rating level' greater than 5dB above background and/or events exceeding 88 dB L _{max}

Table 1: Camden's Noise Criteria (Ref BS 4142) *10dB should be increased to 15dB if the noise contains audible tonal elements. (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.

BS 4142: 2014

- 3.2 BS 4142:2014 [Reference 2] provides a method for rating the effects of industrial and commercial sound on residential areas.
- 3.3 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.
- 3.4 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).

4.0 ASSESSMENT METHODOLOGY

4.1 The following assessment methodology has been used:

- i. Background noise measurements have been undertaken to determine existing levels of background noise at the nearest residential properties;
- ii. Based on the survey results and Camden Council's requirements, plant noise limits have been defined;
- iii. Calculations have been undertaken to determine the noise level associated with the proposed new plant at the nearest noise sensitive receptors.

5.0 ENVIRONMENTAL NOISE SURVEY

Survey Method

- 5.1 Environmental noise measurements were undertaken at the site between the 19th and 25th October 2022, in order to determine the prevailing background noise levels in the area.
- 5.2 The monitor was installed in free-field conditions at roof level, overlooking Dyott Street. This location is considered representative of nearby residential properties and is shown in Figure 1.
- 5.3 Background noise levels were measured using the following equipment:
 - Rion precision sound level meter Type NL-52;
 - Brüel & Kjær acoustic calibrator Type 4231.
- 5.4 Noise 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 3].
- 5.5 The instrumentation's calibration was checked before and after the surveys in accordance with the manufacturer's instructions. No significant drift in calibration was recorded. Calibration of 24 Acoustics' equipment is traceable to National Standards. All instruments were fitted with environmental weather shields during the surveys.
- 5.6 Weather conditions during the survey were fine and dry with wind speeds generally below 5 m/s.

Results

- 5.1 The results of the background noise surveys are described graphically in Appendix B and summarised in Table 2 (analysed into hourly daytime periods and 15-minute night-time periods in accordance with BS 4142).

Date	Typical Background Noise Level, dB	
	Daytime, L _{A90,1 hour} (07:00-23:00 hrs)	Night-Time, L _{A90,15 min} (23:00-07:00 hrs)
Wednesday 19/10/2022	55	50
Thursday 20/10/2022	54	51
Friday 21/10/2022	55	50
Saturday 22/10/2022	55	50
Sunday 23/10/2022	52	50
Monday 24/10/2022	54	49
Tuesday 25/10/2022	55	-
Representative	54	50

Table 2: Location 1 - Summary of Background Noise Levels.

- 5.7 24 Acoustics determines the typical background level to be the average minus one standard deviation.
- 5.8 Prevailing background noise levels at the measurement location were determined by road noise from New Oxford Street (A40).
- 5.9 With reference to the above survey data and the requirements of Camden Council (controlled to 10 dB below the background noise level) noise from the plant should not exceed the following levels, outside nearby residential properties:
- 44 dB dB L_{Aeq, 1hour} during daytime and evening operation (07:00 to 23:00 hours)
 - 40 dB dB L_{Aeq, 15min} during night-time operation (23:00 to 07:00 hours)
- 5.10 The nearest residential properties are understood to be at Parnell House, Streatham Street at a distance of 20 metres from the nearest plant (shown as Receptor 1 in Figure 1) and no. 3 Bloomsbury Street at a distance of approximately 40 metres from the nearest plant (shown as Receptor 2 in Figure 1).

6.0 PLANT NOISE ASSESSMENT

- 6.1 Fourteen condensers will be located on the roof of the 8th floor of the building, in place of the existing plant servicing the offices at 78 New Oxford Street.
- 6.2 The nearest windows at Parnell House, Streatham Street at an approximate distance of 18 metres are on the southern façade at 5th floor level. Significant screening between the condensers and receptor, provided by the edge of the building exists.
- 6.3 The nearest windows at 3 Bloomsbury Street, at an approximate distance of 40 metres, are on the western façade at 4th floor level. These windows also benefit from some roof edge screening.
- 6.4 Manufacturer supplied noise data for the proposed plant has been used in the calculations and is shown in Table 2.

Unit	SPL (dB) at 1m per Octave Band (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
Mitsubishi PUMY-P125VKM6	60	59	56	53	52	47	40	33	56

Table 2: Manufacturer's Noise Data

- 6.5 Based on the manufacturer's noise data, calculations have been undertaken to determine noise from proposed plant at the nearest residential properties. Calculations include corrections for distance and screening.
- 6.6 The calculated noise arising from the replacement plant at the nearest residential properties are shown in Table 3.

Receptor	Maximum Plant Noise Level, dB	
	Daytime, L _{Aeq} , 1 hour (07:00 – 23:00)	Night-time, L _{Aeq} , 15 mins (07:00 – 23:00)
5 th Floor Parnell House	32	32
4 th Floor No. 3 Bloomsbury Street	26	26
Plant Noise Limit	44	40

Table 3: Calculated Plant Noise Levels.

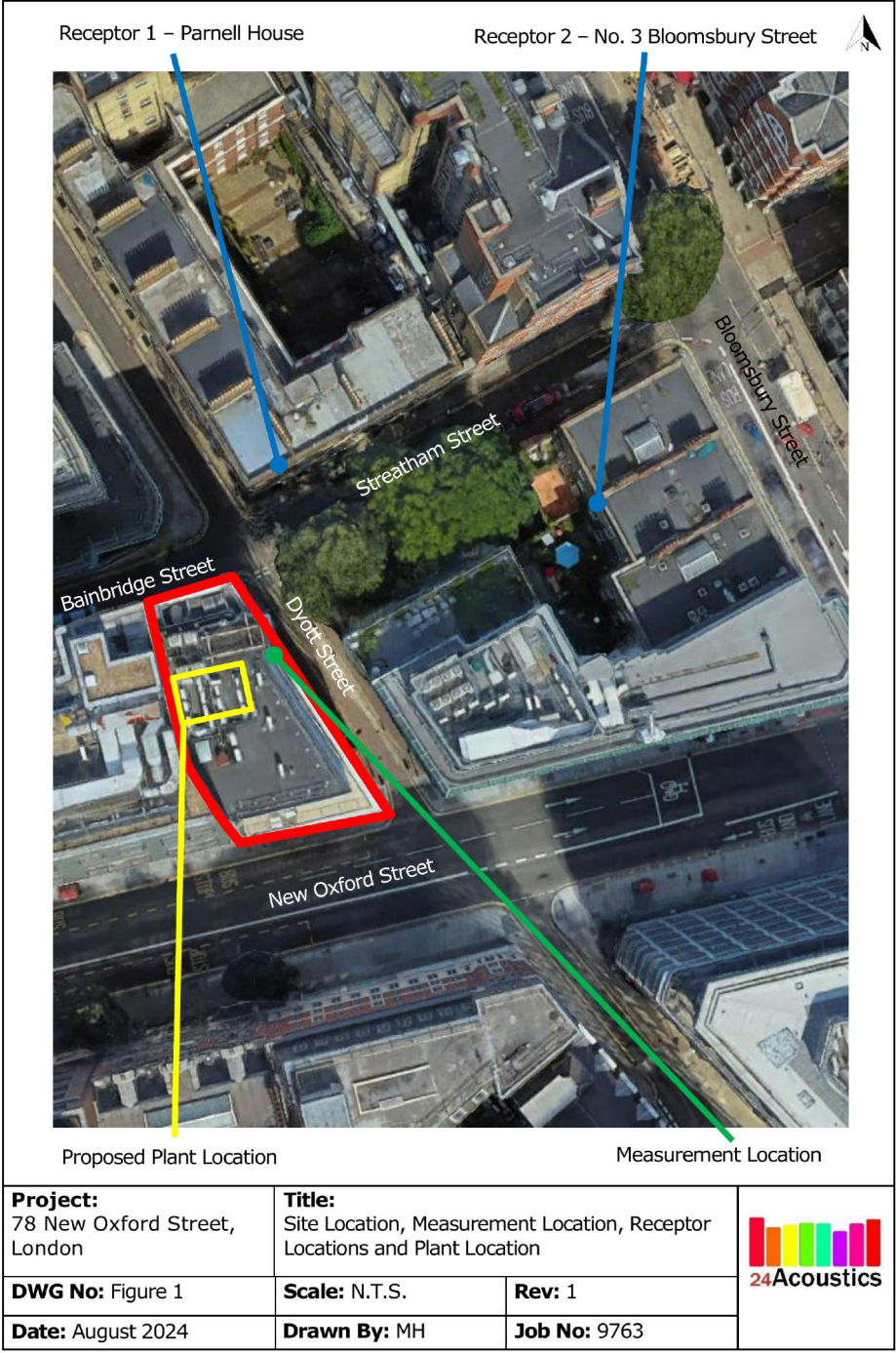
- 6.7 The predicted noise levels comply with required Camden Council's criteria.

7.0 CONCLUSIONS

- 7.1 24 Acoustics Ltd has been instructed by Levy Real Estate LLP on behalf of Fairgate Estates Ltd to undertake a noise assessment for new rooftop plant at 78 New Oxford Street, London.
- 7.2 Environmental noise measurements have been undertaken at the site to determine existing noise background noise levels in the area.
- 7.3 Based upon the survey results and Camden Council's plant noise requirements, maximum plant noise levels have been established, to be achieved at the nearest residential properties.
- 7.4 Calculations have been undertaken to demonstrate that the proposed plant achieves Camden Council's criterion for noise emissions.

REFERENCES

1. Camden Local Plan, Adoption Version, June 2017.
2. British Standards Institution. British Standard 4142:2014. Methods for Rating Industrial and Commercial Sound, 2014.
3. British Standards Institution. British Standard 7445:1991 Description and measurement of environmental noise Part 2 - Acquisition of data pertinent to land use, 1991.





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 – NOISE SURVEY RESULTS

