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78 NEW OXFORD STREET

LONDON

PLANT NOISE ASSESSMENT

Technical Report: R9763-1 Rev 0

Date: 29th November 2022

For: Fairgate Estates Ltd C/O Levy Real Estate LLP
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24 Acoustics Document Control Sheet

Project Title: 78 New Oxford Street, London – Plant Noise Assessment

Report Ref: R9763-1 Rev 0

Date: 29th November 2022

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For and on behalf of 24 Acoustics Ltd				

Document Status and Approval Schedule

Revision	Description	Prepared By	Reviewed & Approved By
0	Approved for Issue	Miles Hodge	Stephen Gosling

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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 Parnel 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_{Amax}	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88 dB L_{Amax}	'Rating level' greater than 5dB above background and/or events exceeding 88 dB L_{Amax}

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 20 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)
5th Floor Parnell House	31	31
4th Floor No. 3 Bloomsbury Street	24	24
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.

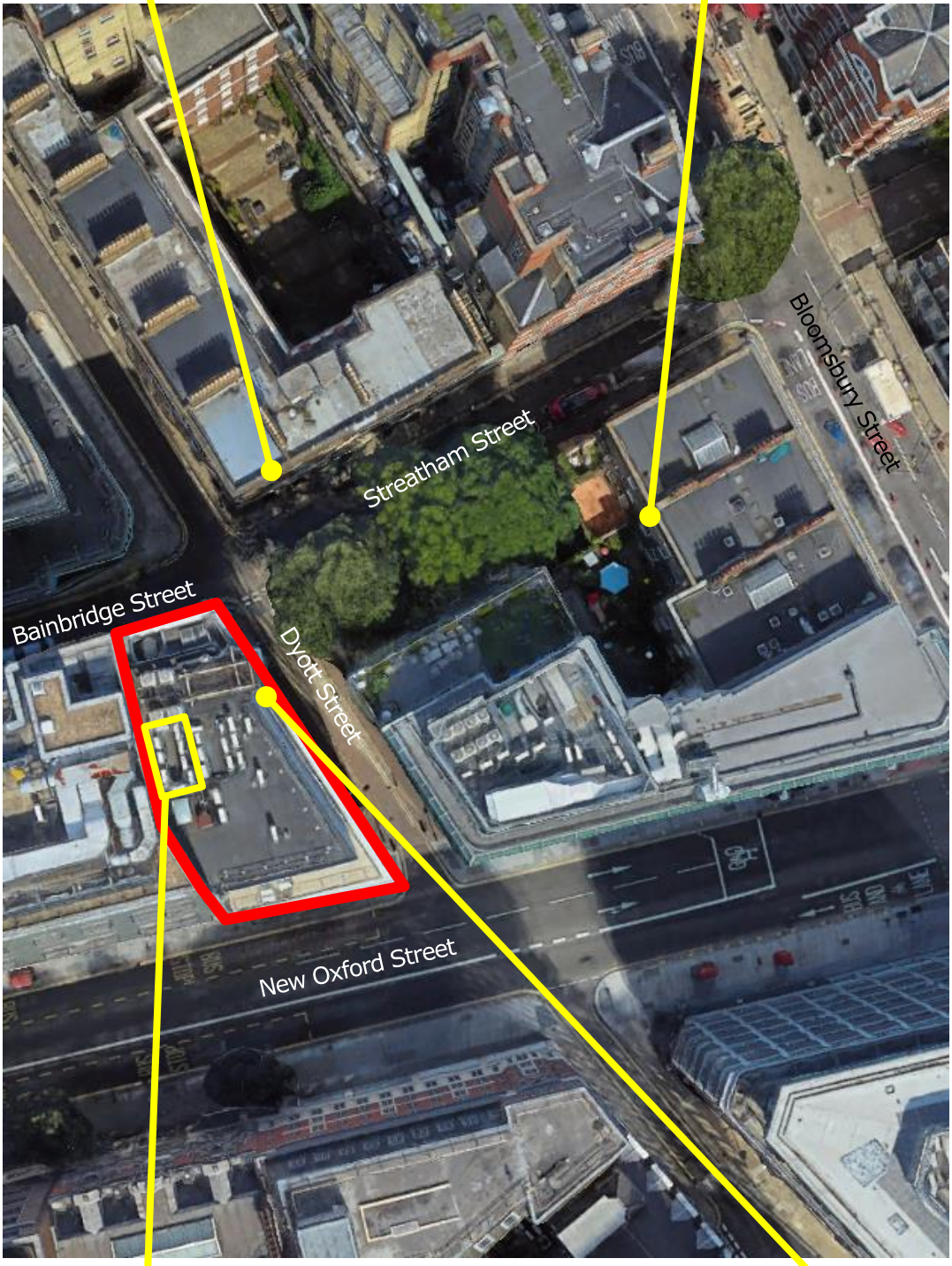
7.4 Calculations have been undertaken to demonstrate that the proposed plant achieves Camden Council's criterion for noise emissions.

REFERENCES

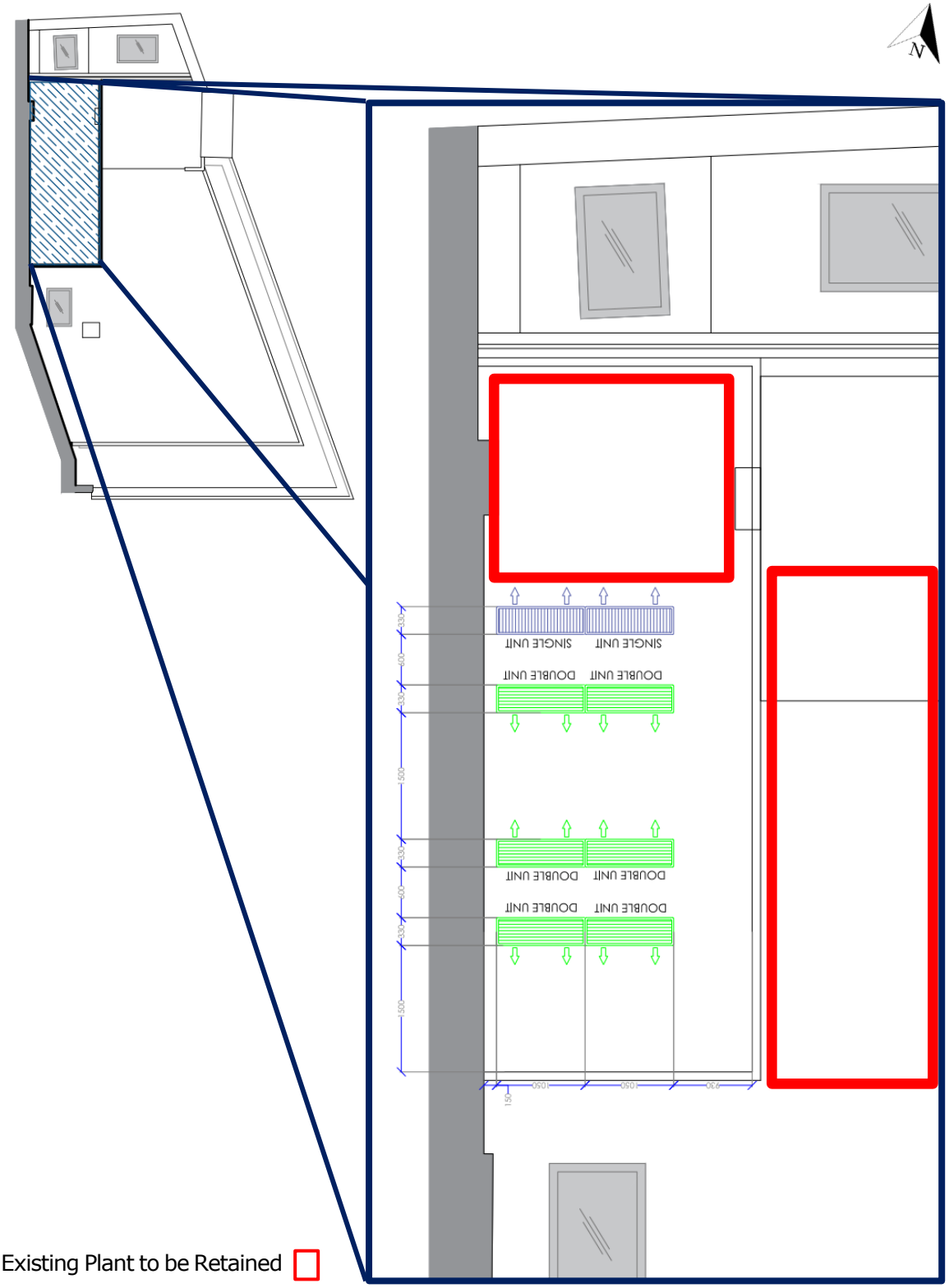
1. Camden Local Plan, Adoption Version, June 2017.

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.



Project: 78 New Oxford Street, London	**Title:** Site Location, Measurement Location, Receptor Locations and Plant Location	
DWG No: Figure 1	**Scale:** N.T.S.	**Rev:** 0
Date: November 2022	**Drawn By:** MH	**Job No:** 9763



Project: 78 New Oxford Street, London	**Title:** Proposed New External Plant Layout	
DWG No: Figure 2	**Scale:** N.T.S.	**Rev:** 0
Date: November 2022	**Drawn By:** MH	**Job No:** 9763

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 internal, 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