hepworth acoustics

LAND ADJACENT TO NO. 1 ST JOHNS WOOD PARK, LONDON NW8

CONDITION 12 NOISE ASSESSMENT

On behalf of:

GPF Lewis

Report No: P18-492-R02
July 2022

LAND ADJACENT TO NO. 1 ST JOHNS WOOD PARK, LONDON NW8

CONDITION 12 NOISE ASSESSMENT

Report prepared by:
Hepworth Acoustics Ltd
Hamilton House
Mabledon Place
London
WC1H 9BB

On behalf of:
GPF Lewis

Report prepared by:
Thomas Bailess MEng MIOA – Principal Consultant

[redacted]

Report checked by:
Graham Bowland BSc MIOA – Technical Director

CONTENTS

1.0 INTRODUCTION

1.1 Hepworth Acoustics Ltd was commissioned by GPF Lewis to carry out a noise assessment relating to Condition 12 of the planning permission for the approved residential development located adjacent to No. 1 St Johns Wood Park, London NW8 6QS.

1.2 Camden Council have granted conditional planning permission for the development, application reference 2021/2368/P. This includes Condition 12 relevant to noise, which reads as follows:

12. Prior to the installation of any items of fixed plant associated with the operation of the development, a noise report shall be submitted to and approved in writing by the local planning authority.

The noise report shall demonstrate that cumulative sound levels from external building services and fixed plant are 10dB or more below the lowest background sound level (15dB if tonal components are present) at the nearest sensitive receptor at any time.

1.3 The aim of this report is to determine whether the cumulative sound levels from external building services and fixed plant complies with the requirements of Condition 12, or whether further noise mitigation measures are required. This report is further to our initial acoustic assessment, report reference P18-492-R01, dated October 2018.

1.4 The site is bounded to the east by St Johns Wood Park. To the north and west are private garages, with the apartment blocks at Boydell Court beyond. To the south is a residential house at No. 1 St Johns Wood Park, which is the nearest noise-sensitive receptor. The site location plan is shown in Figure 1.

1.5 Outdoor mechanical plant proposed for the development includes ten condensers located on the rooftop. This comprises 8no. Mitsubishi PUMY-SP112VKM and 2no. Mitsubishi PUMY-SP140VKM.

1.6 This assessment is based on drawing MC177-M.20 Revision B, dated 2nd March 2022, from Michael Jones & Associates LLP.

1.7 The various noise indices referred to in this report are described in Appendix I. All noise levels mentioned in the text have been rounded to the nearest decibel, as fractions of decibels are imperceptible.

2.0 ENVIRONMENTAL NOISE SURVEY

2.1 A survey of prevailing environmental noise levels was previously carried out at the site to determine the background noise levels. Continuous noise monitoring was undertaken in sequential 5-minute samples from 14:40 on Monday 1st October to 17:00 on Tuesday 2nd October 2018. The noise measurements were taken in 'free-field' conditions with the microphone at approximately 3.5 metres above ground level at the location shown in Figure 1.

2.2 The lowest measured background noise level was 37 dB $L_{A90,5mins}$. The detailed results are presented in Appendix II in graph form.

2.3 The dominant noise source during the noise survey was road traffic on the local highways.

2.4 The weather conditions throughout the noise survey were mild, dry, and overcast. Wind was from the west, with wind speeds below 5 m/s. These were considered suitable conditions for the survey.

2.5 The continuous noise monitoring measurements were undertaken using a Brüel & Kjær 2250 Type 1 Sound Analyser (serial no. 3011626) fitted with a windshield.

2.6 Calibration checks were carried out on the meter before and after the survey using a Brüel & Kjær Type 4231 sound calibrator (serial no. 2412667). No variation in the calibration levels was observed.

3.0 NOISE ASSESSMENT

3.1 The manufacturer's sound pressure level data (in octave bands) of the equipment when measured at 1 metre is shown in Table 1.

Table 1: Equipment Octave Band Sound Pressure Level Data @ 1 metre, dB L_p

Make	Model	Octave Band Centre Frequency (Hz)							
		63	125	250	500	1k	2k	4k	8k
Mitsubishi	PUMY-SP112VKM	75	74	72	71	66	61	59	55
Mitsubishi	PUMY-SP140VKM	67	66	64	63	58	53	51	47

3.2 Based on the above data and our experience with this equipment, we do not expect the equipment noise to feature tonal components.

3.3 There will be hemi-spherical distance attenuation of at least 16 metres to the nearest habitable room window. This results in distance attenuation of at least 24 dB(A).

3.4 The condensers will be shielded from the neighbouring residences by the parapet wall around the rooftop. This is calculated to reduce noise levels at the receptor by at least 14 dB(A). The calculation is shown in Appendix III.

3.5 Taking into consideration distance attenuation and barrier attenuation, the predicted cumulative plant noise levels outside the nearest neighbouring habitable room window are 25 dB(A). This assumes that all condensers are running simultaneously to consider a worst-case scenario. The detailed calculation is in Appendix III.

3.6 The predicted cumulative plant noise levels are more than 10 dB(A) below the lowest measured background noise level at the site. This therefore complies with the requirements of Condition 12. Based on this, no special noise mitigation measures are required, beyond the rooftop parapet wall already specified.

4.0 SUMMARY AND CONCLUSIONS

4.1 Hepworth Acoustics has undertaken a noise assessment regarding Condition 12 of the planning permission for the approved residential development on land adjacent to No. 1 St Johns Wood Park, London NW8 6QS.

4.2 A noise survey has been undertaken at the site and the lowest background noise levels have been determined.

4.3 The cumulative noise levels outside the nearest neighbouring residences of the plant associated with the development have been predicted. These are more than 10 dB(A) below the lowest measured background sound levels.

4.4 Based on this assessment, we predict that the external plant will comply with the noise requirements of Condition 12 of the planning permission.

Figure 1 – Site plan

Appendix I: Noise Units & Indices

Sound and the decibel

A sound wave is a small fluctuation of atmospheric pressure. The human ear responds to these variations in pressure, producing the sensation of hearing. The ear can detect a very wide range of pressure variations. In order to cope with this wide range of pressure variations, a logarithmic scale is used to convert the values into manageable numbers. Although it might seem unusual to use a logarithmic scale to measure a physical phenomenon, it has been found that human hearing also responds to sound in an approximately logarithmic fashion. The dB (decibel) is the logarithmic unit used to describe sound (or noise) levels. The usual range of sound pressure levels is from 0 dB (threshold of hearing) to 120 dB (threshold of pain).

Due to the logarithmic nature of decibels, when two noises of the same level are combined together, the total noise level is (under normal circumstances) 3 dB(A) higher than each of the individual noise levels e.g. 60 dB(A) plus 60 dB(A) = 63 dB(A). In terms of perceived 'loudness', a 3 dB(A) variation in noise level is a relatively small (but nevertheless just noticeable) change. An increase in noise level of 10 dB(A) generally corresponds to a doubling of perceived loudness. Likewise, a reduction in noise level of 10 dB(A) generally corresponds to a halving of perceived loudness.

Frequency and Hertz (Hz)

As well as the loudness of a sound, the frequency content of a sound is also very important. Frequency is a measure of the rate of fluctuation of a sound wave. The unit used is cycles per second, or hertz (Hz). Sometimes large frequency values are written as kilohertz (kHz), where 1 kHz = 1000 Hz.

Young people with normal hearing can hear frequencies in the range 20 Hz to 20 kHz. However, the upper frequency limit gradually reduces as a person gets older.

The ear is not equally sensitive to sound at all frequencies. It is less sensitive to sound at low and very high frequencies, compared with the frequencies in between. Therefore, when measuring a sound made up of different frequencies, it is often useful to 'weight' each frequency appropriately, so that the measurement correlates better with what a person would actually hear. This is usually achieved by using an electronic filter called the 'A' weighting, which is built into sound level meters. Noise levels measured using the 'A' weighting are denoted dB(A) or dBA.

Glossary of Terms

When a noise level is constant and does not fluctuate, it can be described adequately by measuring the dB(A) level. However, when the noise level varies with time, the measured dB(A) level will vary as well. In this case it is therefore not possible to represent the noise climate with a simple dB(A) value. In order to describe noise where the level is continuously varying, a number of other indices can be used. The indices used in this report are described below.

$L_{Aeq,T}$ This is the A–weighted 'equivalent continuous noise level' which is an average of the total sound energy measured over a specified time period, T. In other words, L_{Aeq} is the level of a continuous noise which has the same total (A–weighted) energy as the real fluctuating noise, measured over the same time period. It is increasingly being used as the preferred parameter for all forms of environmental noise.

$L_{Amax,f}$ This is the maximum A-weighted noise level that was recorded during the monitoring period with the sound level meter set to 'fast'.

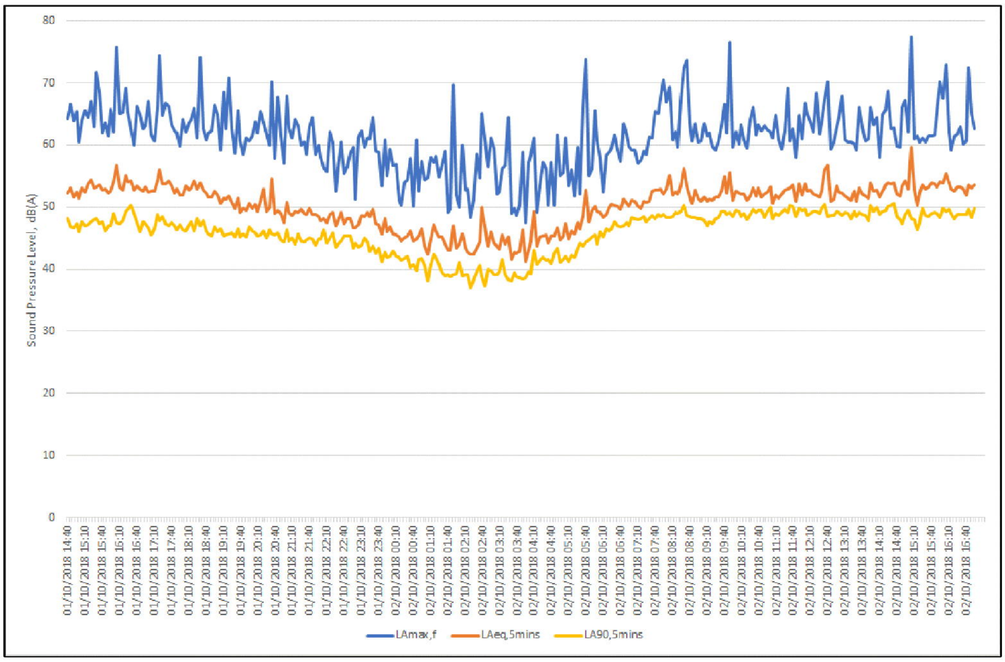
$L_{A90,T}$ This is the A–weighted noise level exceeded for 90% of the time period, T. L_{A90} is used as a measure of background noise.

L_W This is the sound power level of a sound source, in decibels, which is 10 times the logarithm to the base 10 of the ratio of sound power radiated by the source to a reference power. The reference power is 1 picowatt (1 x 10^{-12} watt). The sound power level is the fundamental measure of the total sound energy radiated by a source per unit time.

Appendix II: Noise Survey Results

Equipment:	Brüel & Kjær 2250 Type 1 Sound Analyser (serial no. 3011626) fitted with a windshield.
Weather:	Dry, mild, wind speed below 5 m/s.

All levels in dB re 20 µPa.



Appendix III: Calculations

Noise Calculations

Description	63	125	250	500	1k	2k	4k	8k	dB(A)	Comments
1no. PUMY-SP112VKM Lp	64	52	52	49	46	41	35	29		Manufacturer's data
8no. PUMY-SP112VKM Lp	73	61	61	58	55	50	44	38		
1no. PUMY-SP140VKM Lp	59	60	51	52	47	42	37	31		Manufacturer's data
2no. PUMY-SP140VKM Lp	62	63	54	55	50	45	40	34		
Total Lp	*73*	*65*	*62*	*60*	*56*	*51*	*45*	*40*		
Barrier attenuation	-9	-11	-14	-16	-19	-22	-25	-28		As per BS 5228
Distance attenuation	-24	-24	-24	-24	-24	-24	-24	-24		16 metres
Receiver façade correction	3	3	3	3	3	3	3	3		
Resultant SPL	**43**	**33**	**27**	**23**	**16**	**8**	**-1**	**-9**	**25**	

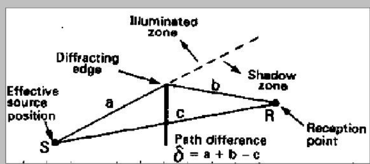
Barrier Calculations

Barrier Attenuation	h (Source)	h(Receiver)	h(Barrier)	d(S-B)	d(B-R)	d(S-B-R)	d(SBR)	d(SR)
	11.8	10.0	13.0	1.0	14.0	15.0	15.88	15.11

a	b	c	Path Diff	Log
1.56	14.32	15.11	0.772257	-1.12E-01

Frequency (Hz)	500	h(S)-H(R)	h(S)-H(R)/SBR	Theta	h(min shadow)	Zone
Speed (c)	344	1.8	0.12	0.119429	11.68	Shadow

	At Frequency (Hz)	Freq Hz		Barrier Correction dB
Fresnel				-16.8
Octave Band		63	BS5228	-9.4
		125		-11.5
		250		-14.1
		500		-16.8
		1000		-19.7
		2000		-22.6
		4000		-25.6
		8000		-28.6



Minimum mass kg/m² 10.0

	BS5228							
	63	125	250	500	1k	2k	4k	8k
Fresnel/BS5228	-9	-12	-14	-17	-20	-23	-26	-29