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Acoustic Report

24 Neal Street

Acoustic Report

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1 Executive Summary

Munro Acoustics were commissioned by Task Displays Ltd. to carry out a 24-hour noise survey at 24 Neal Street, Covent Garden WC2 to ascertain whether the noise level at the nearest noise sensitive resident window due to the new plant equipment would meet the requirements set by Camden Council.

The predicted L_{Aeq} noise level due to the plant at the nearest noise sensitive window is approximately 11 dB lower than the lowest measured L_{A90} during the proposed hours of operation. The plant meets the criteria set by the Camden Council.

The sum of L_{Aeq}'s at each octave bands for all the equipment should not exceed more than 1dB to the existing background level (L_{A90}) in the same octave band.

2 Introduction

Munro Acoustics were commissioned by Task Displays Ltd to carry out a 24-hour noise survey at 24, Neal Street, WC2. The purpose of the survey was to ascertain the lowest background noise level (L_{A90}). The predicted noise level at the nearest noise sensitive window due to the new plant equipment is calculated and compared to the requirements set by Camden Council.

3 Noise Criteria

24 Neal Street falls in the borough of Camden. The requirement for noise from new plant in this area is that it should be at least 5 dB below the existing background noise level (L_{A90}) at the nearest sensitive residential window. The other requirement is that the sum of L_{Aeq}'s at each octave bands for all the equipment should not exceed more than 1dB to the existing background level (L_{A90}) in the same octave band.

4 Site and Surroundings

The site is a light well behind a four-storey building located on Neal Street. The front of the building faces Neal Street and is adjacent to a pub. The nearest sensitive resident window to the proposed plant is 12.5 metres high on the top floor looking into the light well. The main sources of noise at the nearest residential property are Air con and extractor units already present in the middle of the light well close to the window and light traffic noise from Shelton Street. Two planes were heard flying over during the presence of Munro Acoustics on the site.

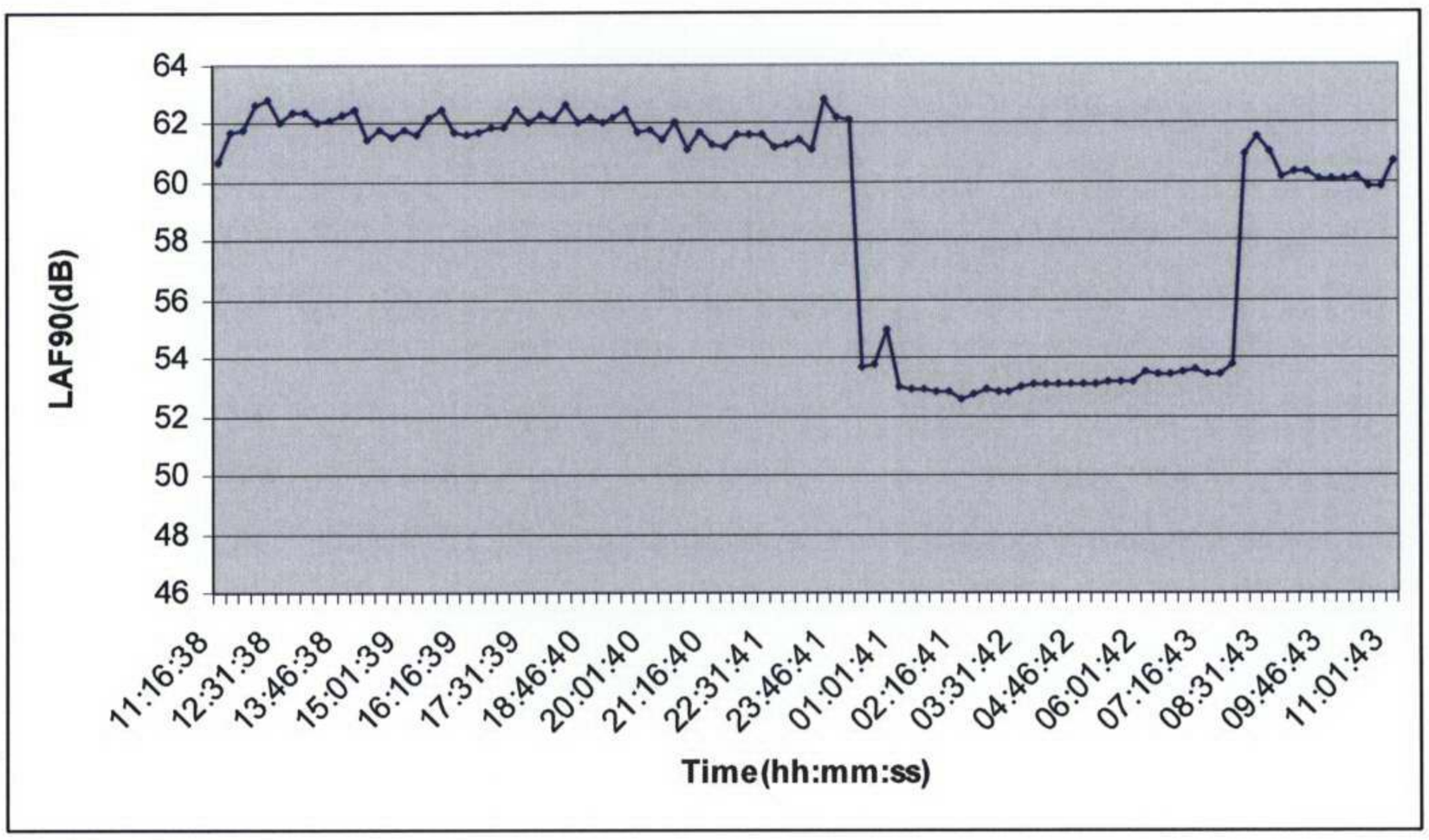
It is proposed to use three condenser units on the bottom of the light well 1m from the floor. The distance from these units to the nearest noise sensitive window is approximately 12.5 m. (distance taken from centre of units to the sensitive window).

The proposed hours of operation for the plant are 10:30 -19:00 hours Monday-Saturday and 12:00-17:00 hours on Saturdays.

5 Noise Survey

A Neutrik NC10 sound analyser and a MTG WME250 weatherproof microphone were used for the noise survey. The equipment was checked for calibration using a Castle GA607 calibrator before and after the measurement, no drift was detected. Continuous measurements were taken in 15-minute segments from 11.15 on Tuesday 08th August to 11.15 on Wednesday 09th August 2006.

The microphone was positioned on a stand on the flat surface of the scaffolding framework in the light well at a distance of 2 metres to the nearest noise sensitive window. The background noise level at the measurement position was representative of the background noise at the nearest noise sensitive window.



Weather conditions during the survey were warm, dry and no wind.

Figure 1 24-hour noise survey data

The lowest background noise level measured in the 24-hour period and during the proposed hours of operation was L_{A90} = 59.8 dB at 10:31/10:46.

Full measurement data is given in Appendix 1

Noise assessment

The lowest measured background noise level (L_{A90}) during the proposed operating hours of the plant was 59.8 dB, measured at10: 31 /10:46.

In order to meet the requirements of Camden Council the noise generated by the new plant must be 5 dB below this level at the nearest residential window, i.e. $L_{Aeq} \leq 54.8$ dB. Based on manufacturers data the predicted noise level from the new plant will be 42.9 dBA at the nearest residential window.

The calculations are given Appendix 2.

For criterion 1 the SPL given by the manufacturer were used to find the levels at the nearest sensitive window through the direct path.

For criterion 2 the difference between the single values of measured L_{eq} and the L_{90} is recorded at the 10:31/10:46 (lowest recorded L_{A90}). The octave band values for L_{A90} are obtained from octave band values of L_{Aeq}.

6 Conclusions

The predicted noise level from the plant is approximately 11dB below the requirement set by Camden Council.

Appendix 1 – Noise Survey Data

Start hh:m	LAF_90%
11:16:38	60.7
11:31:38	61.7
11:46:38	61.8
12:01:38	62.6
12:16:38	62.8
12:31:38	62
12:46:38	62.4
13:01:38	62.4
13:16:38	62
13:31:38	62.1
13:46:38	62.3
14:01:38	62.5
14:16:39	61.4
14:31:39	61.8
14:46:39	61.5
15:01:39	61.8
15:16:39	61.6
15:31:39	62.2
15:46:39	62.5
16:01:39	61.7
16:16:39	61.6
16:31:39	61.7
16:46:39	61.9
17:01:39	61.9
17:16:39	62.5
17:31:39	62
17:46:40	62.3
18:01:39	62.1
18:16:40	62.6
18:31:40	62
18:46:40	62.2
19:01:40	62
19:16:40	62.2
19:31:40	62.5
19:46:40	61.7
20:01:40	61.8
20:16:40	61.4
20:31:40	62
20:46:40	61.1
21:01:40	61.7
21:16:40	61.3
21:31:40	61.2
21:46:40	61.6
22:01:40	61.6
22:16:41	61.6
22:31:41	61.2
22:46:41	61.3
23:01:41	61.4

Start hh:m	LAF_90%
23:16:41	61.1
23:31:41	62.8
23:46:41	62.2
00:01:41	62.1
00:16:41	53.7
00:31:41	53.8
00:46:41	55
01:01:41	53
01:16:41	52.9
01:31:41	52.9
01:46:41	52.8
02:01:41	52.8
02:16:41	52.6
02:31:41	52.7
02:46:42	52.9
03:01:42	52.8
03:16:42	52.8
03:31:42	53
03:46:42	53.1
04:01:42	53.1
04:16:42	53.1
04:31:42	53.1
04:46:42	53.1
05:01:42	53.1
05:16:42	53.2
05:31:42	53.2
05:46:42	53.2
06:01:42	53.5
06:16:42	53.4
06:31:42	53.4
06:46:43	53.5
07:01:43	53.6
07:16:43	53.4
07:31:43	53.4
07:46:43	53.8
08:01:43	60.9
08:16:43	61.5
08:31:43	61
08:46:43	60.2
09:01:43	60.3
09:16:43	60.3
09:31:43	60.1
09:46:43	60.1
10:01:43	60.1
10:16:43	60.2
10:31:43	59.8
10:46:43	59.8
11:01:43	60.7

Appendix 2 – Calculation

Criteria 1

Manufacturers data
Sound pressure level at 1m

	Octave Band Centre Frequency - Hz							
	63	125	250	500	1k	2k	4k	8k
Daikin RXS25	45	46	42	41	39	34	28	22
Daikin RXS35	44	39	45	41	39	33	28	20
Daikin RXS60	55	60	53	46	45	43	41	36

1- RXS25

	Octave Band Centre Frequency - Hz							
	63	125	250	500	1k	2k	4k	8k
SPL	45	46	42	41	39	34	28	22
Distance correction (12.5m)	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9
Directivity	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
SPL at window	32.1	33.1	29.1	28.1	26.1	21.1	15.1	9.1
A-weighting	-26.2	-16.1	-8.6	-3.2	0.0	1.2	0.8	-2.0

Total L_{Aeq} (1 unit) 30.4 dBA

2- RXS35

	Octave Band Centre Frequency - Hz							
	63	125	250	500	1k	2k	4k	8k
SPL	44	39	45	41	39	33	28	20
Distance correction (12.5m)	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9
Directivity	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
SPL at window	31.1	26.1	32.1	28.1	26.1	20.1	15.1	7.1
A-weighting	-26.2	-16.1	-8.6	-3.2	0.0	1.2	0.8	-2.0

Total L_{Aeq} (1 unit) 30.5 dBA

3- RXS60

	Octave Band Centre Frequency - Hz							
	63	125	250	500	1k	2k	4k	8k
SPL	55	60	53	46	45	43	41	36
Distance correction (12.5m)	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9	-21.9
Directivity	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
SPL at window	42.1	47.1	40.1	33.1	32.1	30.1	28.1	23.1
A-weighting	-26.2	-16.1	-8.6	-3.2	0.0	1.2	0.8	-2.0

Total L_{Aeq} (1 unit) 38.7 dBA

Total (1+2+3)	**39.9**	**dBA**
Façade correction	**3.0**	**dB**

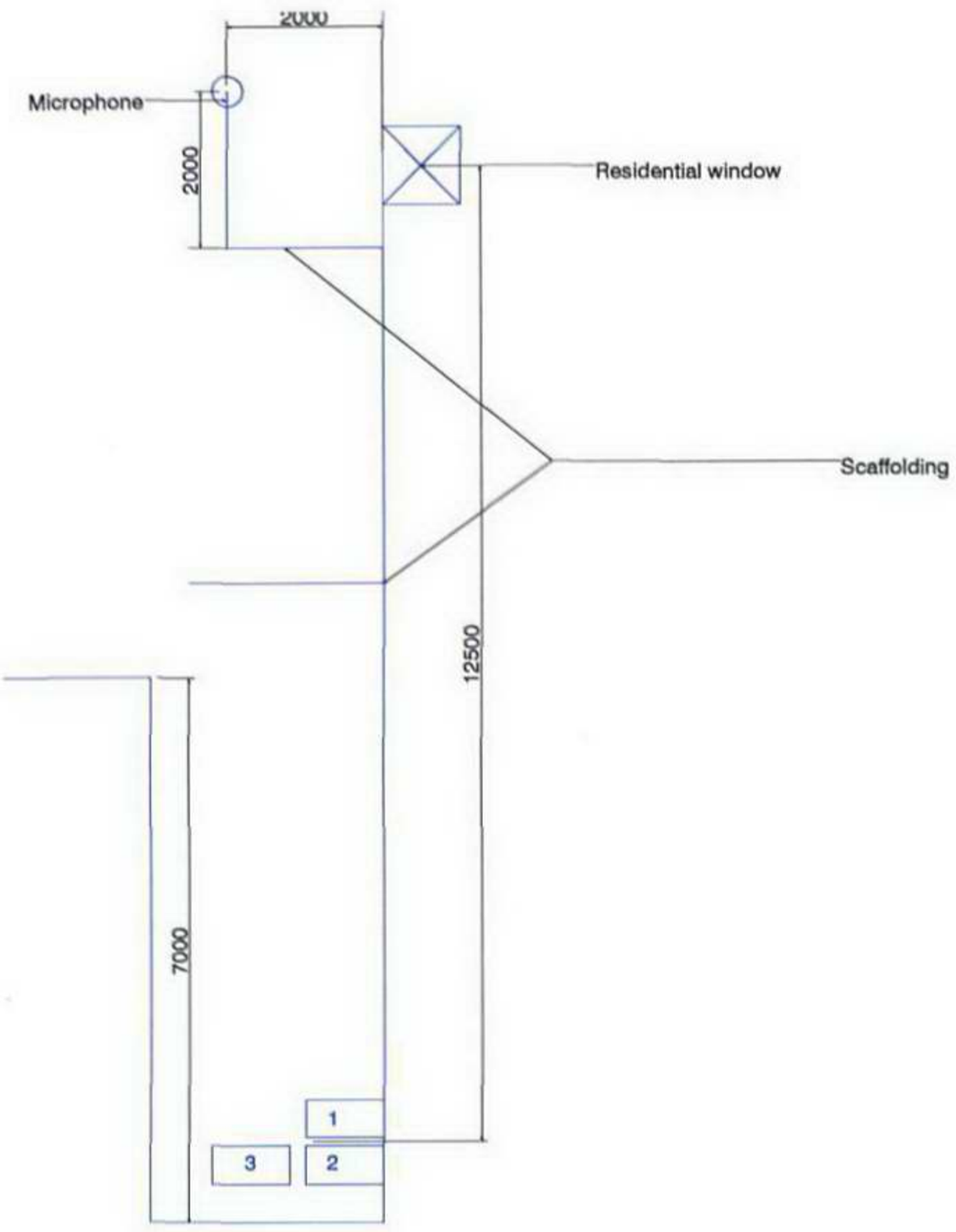
SPL at 1m	**42.9**	**dBA**

Criteria 2

	Octave Band Centre Frequency - Hz							
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**
Measured Leq	66	69	70	55	52	46	39	43
Measured Laeq	39	53	61	52	52	47	40	41
Estimated LA90(No plant)	38	52	60	51	50	46	38	40
Estimated LA90(with plant)	38	52	60	51	51	46	39	40
Difference	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.2**	**0.5**	**0.1**

Note: The octave band values for L_{A90} were estimated from the measured octave band values of L_{Aeq}.

Appendix 3 – Site Section



Appendix 4 – Definitions

Decibel (dB)	The unit used to measure sound levels.
SPL	Sound pressure level
SWL	Sound power level
A-weighting	A network of corrections applied to all relevant frequencies to simulate the frequency response of the human ear.
L_{Aeq}	The equivalent continuous A-weighted noise level over a given time period
L_{A90}	The A-weighted noise level exceeded for 90% of the measurement period. This is frequently referred to as the 'background' noise.