SANDY BROWN

Consultants in Acoustics, Noise & Vibration

15115-R01-A

10 April 2015

Web Reservations, High Holborn House

Plant noise assessment report

55 Charterhouse Street, London EC1M 6HA T: +44 (0)20 7549 3500
Piccadilly House, 49 Piccadilly, Manchester M1 2AP T: +44 (0)161 771 2020
16 West Terrace, South Queensferry EH30 9LL T: +44 (0)131 331 2020 **post@sandybrown.com**
35 St Paul's Square, Birmingham B3 1QX T: +44 (0)121 227 5020 **www.sandybrown.com**

Sandy Brown Associates LLP
Registered in England & Wales No. OC 307504 Registered Office: 55 Charterhouse Street, London EC1M 6HA

Version	Date	Comments	Author	Reviewer
A	10 Apr 15		Daniela Filipe	Jason Swan

Summary

Sandy Brown Associates LLP (SBA) has been appointed to carry out a planning noise assessment in support of a planning application for the installation of new building services plant in High Holborn House, as part of the office fit out of Web Reservations.

An environmental noise survey was previously performed with a view of determining the existing background noise levels in the area and setting appropriate plant noise limits in line with the requirements of the London Borough of Camden.

Unattended noise monitoring has been performed on the northwest side of High Holborn House in June – July 2013, as part of an ongoing refurbishment of the building.

The lowest background noise levels measured during the June – July 2013 survey were $L_{A90,5min}$ 44 dB during the daytime and $L_{A90,5min}$ 41 dB at night. These background noise levels are considered to be representative of the noise sensitive receivers located at the rear of High Holborn House.

Based on the requirements of the London Borough of Camden, the relevant plant noise limits at the worst affected existing noise sensitive premises to the rear of High Holborn House would be L_{Aeq} 39 dB during the day and L_{Aeq} 36 dB at night. These limits are cumulative and apply with all plant operating under normal conditions.

Two new items of plant have been assessed against these criteria along with previously installed plant. The above plant noise limits can be achieved at all times at the worst affected noise sensitive receivers.

Contents

1 Introduction

Sandy Brown Associates LLP (SBA) has been commissioned by Web Reservations to undertake an assessment in relation to a planning application for the installation of two new external condenser units at High Holborn House, High Holborn, London.

An environmental noise survey was previously performed at High Holborn House for a set of separate planning applications for the building. The results of this survey were used to establish the existing background noise levels in the vicinity of nearby noise sensitive premises. The background noise levels measured enable appropriate limits to be set regarding noise emission from proposed building services plant. These limits are to be set in accordance with the requirements of the London Borough of Camden.

This report presents the survey method, the results of the previously undertaken environmental noise survey, and a discussion of acceptable limits for noise emission from building services plant. Noise levels from the operation of the proposed new items of plant are also assessed in this report and compared with the established limits.

2 Site description

2.1 The site and its surroundings

High Holborn House is located to the north of High Holborn and is surrounded by existing commercial premises to all directions, and residential properties to the west.

The site location in relation to its surroundings is shown in Figure 1, where High Holborn House is indicated in red, the nearest residences are shown in blue. The unattended noise monitoring location on the west side of High Holborn House is also shown in Figure 1 as position A.

2.2 Adjacent premises

The nearest noise sensitive premises to High Holborn House consist of residential dwellings located at 22 – 23 Hand Court at approximately 7 m to the west of the site. These are indicated in blue in Figure 1.

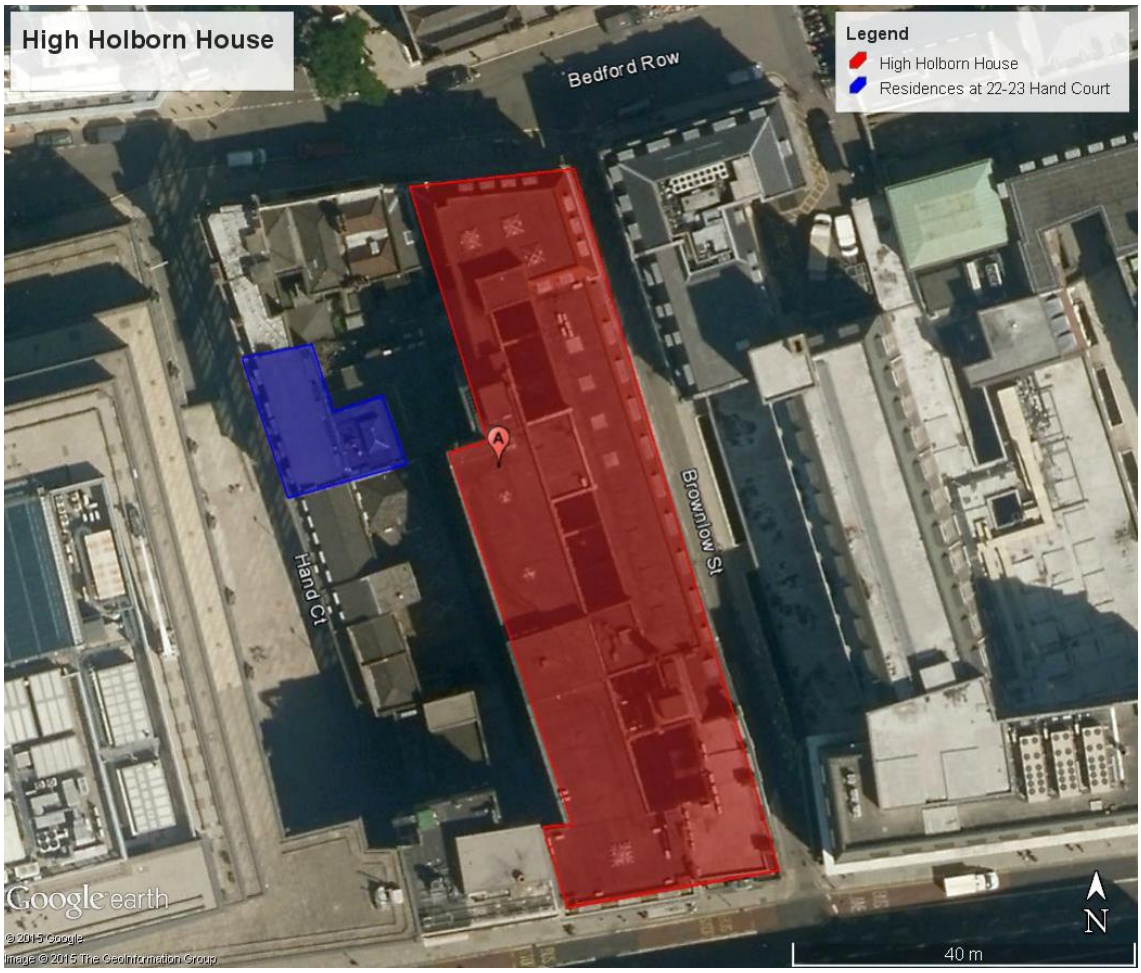


Figure 1 Aerial photo showing the site location (courtesy of Google Earth Pro)

3 Development proposals

New building services plant items are proposed to be installed at High Holborn House, serving the offices of Web Reservations. The new items of plant are proposed to be located within the north lightwell of High Holborn House at ground floor level.

Further details on the proposed items of plant and their locations are given in Section6.3 of this report.

4 Method

4.1 Unattended measurements

A 5 day unattended continuous noise monitoring survey was undertaken at High Holborn House to determine the existing background noise levels in the vicinity of nearby residences screened from High Holborn.

The unattended measurements were carried out by Daniela Filipe with the equipment set to record over 5 minute periods between 27 June 2013 and 1 July 2013.

The microphone was mounted on a tripod at approximately 2 m above the roof of High Holborn House, directly overlooking the existing residences at 22 – 23 Hand Court, and at least 2 m from any other reflective surface. The measurement position used during the unattended noise survey is indicated in Figure 1, denoted by the letter 'A'. The noise levels measured at location A are considered to be free-field levels.

A photograph showing the measurement location is provided in Figure 2. The locations of nearby noise sensitive premises are also indicated in Figure 2. This monitoring location was chosen to be reasonably representative of the noise levels experienced by the nearest noise sensitive premises at the rear of High Holborn House.

Figure 2 Photograph showing unattended noise measurement location (facing northwest)

4.2 Equipment

A Rion NL-52 sound level meter was used to undertake the unattended measurements at location A. The calibration data for the equipment used during the survey is provided in Appendix A of this report.

The sound level meter and microphone were calibrated at the beginning and end of the measurements using their sound level calibrator. No significant deviation in calibration occurred.

4.3 Noise indices

The equipment was set to record a continuous series of broadband sound pressure levels. Noise indices recorded included the following:

- $L_{Aeq,T}$ The A-weighted equivalent continuous sound pressure level over a period of time, T.
- $L_{AFmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period.
- $L_{A90,T}$ The A-weighted sound pressure level exceeded for 90% of the measurement period. Indicative of the background noise level.

The L_{A90} is considered most representative of the background noise level for the purposes of complying with any local authority requirements.

Sound pressure level measurements are normally taken with an A-weighting (denoted by a subscript 'A', eg L_{A90}) to approximate the frequency response of the human ear.

A more detailed explanation of these quantities can be found in BS 7445-1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures.*

4.4 Weather Conditions

The temperatures during the unattended noise measurements between 27 June 2013 and 1 July 2013 at location A varied between 13°C at night and 26°C during the day. The average wind speed was less than 4 m/s.

Light rain occurred on 28 June 2013. However, it is considered that sufficient dry periods occurred during the survey in order to obtain representative measurements.

The above weather conditions are considered suitable to obtain representative measurements.

5 Measurement results

5.1 Observations

The dominant noise sources observed during the survey at location A consisted of distant road traffic on High Holborn, distant construction works and plant serving the buildings surrounding the site. Less significant noise sources included occasional aircraft flying over the site.

5.2 Unattended measurement results

The results of the unattended noise measurements performed at location A are summarised in the following tables. Graphs showing the results of the unattended measurements are provided in Appendix B of this report.

The day and night time ambient noise levels measured during the unattended survey at location A are presented in Table 1.

Table 1 Ambient noise levels measured during the survey at location A

Date	Daytime (07:00 – 23:00) $L_{Aeq,16h}$ (dB)	Night (23:00 – 07:00) $L_{Aeq,8h}$ (dB)
Thursday 27 June 2013	-	50
Friday 28 June 2013	55	50
Saturday 29 June 2013	54	49
Sunday 30 June 2013	53	49
Average	54	50

The minimum background noise levels measured during the unattended survey at location A are given in Table 2.

Table 2 Minimum background noise levels measured during the survey at location A

Date	Daytime (07:00 – 23:00) $L_{A90,5min}$ (dB)	Night (23:00 – 07:00) $L_{A90,5min}$ (dB)
Thursday 27 June 2013	48*	43
Friday 28 June 2013	48	44
Saturday 29 June 2013	45	43
Sunday 30 June 2013	44	41
Monday 1 July 2013	52*	-

* Measurement not made over full period due to monitoring start and end time

The lowest background noise levels measured during the survey at location A were $L_{A90,5min}$ 44 dB during the daytime and $L_{A90,5min}$ 41 dB at night.

6 Noise egress assessment

6.1 Local authority's criteria

The London Borough of Camden planning policy DP28 *Noise and vibration* requires that the noise levels from the operation of all new proposed building services plant does not exceed a level of 5 dB below the lowest background noise level measured during the day and at night at 1 m from the worst affected noise sensitive facade.

If the noise from the new plant and machinery has a distinguishable discrete continuous note (whine, hiss, screech, hum) or if it has distinct impulses (bangs, clicks, clatters, thumps), the noise levels from all plant should not exceed a level of 10 dB below the lowest background noise level measured during the day and night at 1 m from the worst affected noise sensitive facade.

6.2 Plant noise limits

Based on the above criteria, the total noise level resulting from the operation of all new plant at 1 m from the most affected windows of the nearest noise sensitive premises should not exceed 5 dB below the lowest background noise level measured. These limits are set out in Table 3.

The plant noise limits at the residences at 22 – 23 Hand Court given in Table 3 were based on the noise levels measured at location A, on the roof of High Holborn House overlooking Hand Court.

Table 3 Plant noise limits at 1 m from the existing noise sensitive receivers

Location	Maximum sound pressure level at 1 m from noise sensitive premises (dB)	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Residences at 22 – 23 Hand Court	39	36

6.3 Proposed plant

Two new external condenser units are proposed to be installed in the north lightwell of High Holborn House to serve the offices of Web reservations. The units are to consist of two Mitsubishi MUZ-GF60/71VE units. The proposed location for these units is shown in Figure 3.

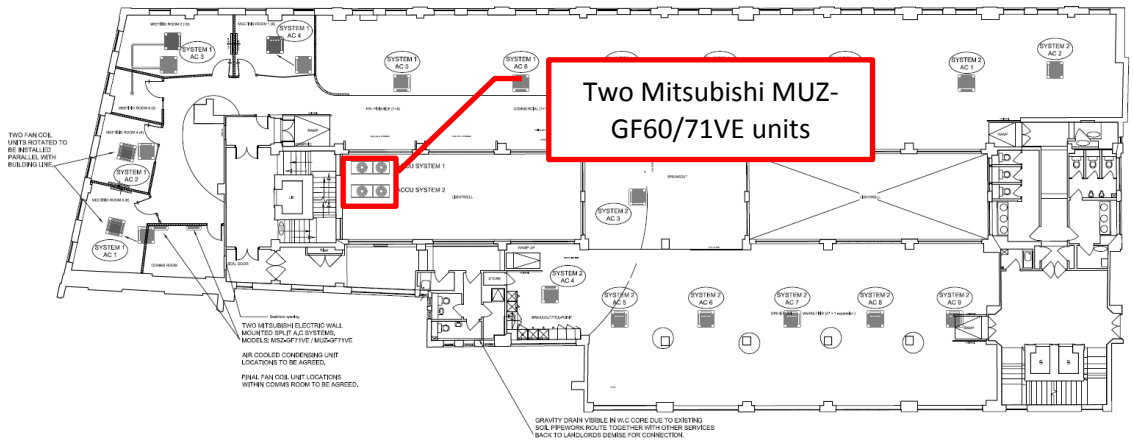


Figure 3 Floor plan showing proposed location for the new condenser units (north is to the left)

The sound pressure levels at 1 m from the proposed Mitsubishi units are presented in Table 4 in accordance with the manufacturer's data.

Table 4 Sound pressure levels at 1 m from the condenser units

Plant item		Octave band centre frequency (Hz)								Overall level dB(A)
		63	125	250	500	1k	2k	4k	8k	
Mitsubishi MUZ-GF60/71VE	Cooling mode	57	59	56	53	50	46	40	32	55
Mitsubishi MUZ-GF60/71VE	Heating mode	56	62	56	51	50	48	40	33	56

6.4 Hours of operation

The proposed plant items to be installed at High Holborn House have the potential of operating both throughout the day and night. Therefore, the 'worst case' noise levels from the new plant, namely the 'heating mode' noise levels from Table 4, were assessed against the night-time noise limits as given in Table 3.

6.5 Assessment

6.5.1 New plant

The noise levels from the simultaneous operation of the new plant items described in Section6.3 have been assessed at the most affected noise sensitive receivers. These are considered to be the residences at 22 – 23 Hand Court, based on the heights of the buildings and their respective distance to the proposed plant location.

Based on the proposed plant layout shown in Figure 3, noise from the new plant will benefit from distance and barrier attenuation provided by the building edge.

The resultant noise level at the worst affected noise sensitive receiver from the simultaneous operation of the two proposed Mitsubishi MUZ-GF-60/71VE units is L_{Aeq} 19 dB.

6.5.2 Previously installed plant

Other planning applications for the installation of new plant on the roof and lightwells of High Holborn House have previously been submitted. Plant noise assessment reports have also been produced for these planning applications. These are as follows:

- *13332-R01-B* dated 19 November 2013;
- *14067-R01-A* dated 11 February 2014;
- *14067-R02-A* dated 25 March 2014;
- *14067-R03-C* dated 17 June 2014;
- *14067-R04-A* dated 24 February 2015.

The cumulative noise levels at the worst affected noise sensitive receivers from the simultaneous operation of all new plant items, including the previous assessments, are given in Table 5.

Table 5 Predicted cumulative noise levels from all new plant at the worst affected sensitive receivers

Worst affected noise sensitive receiver	Predicted noise level from all new plant, L_{Aeq} (dB)	Plant noise limit, $L_{Aeq,5min}$ (dB)
Residences at 22 – 23 Hand Court	36	36

The predicted noise levels given in Table 5 are compliant with the plant noise limits required by the London Borough of Camden.

7 Conclusion

A noise survey has been carried out at High Holborn House to determine the existing background noise levels in the vicinity of the site and surrounding noise sensitive premises.

The lowest background noise levels measured to the rear of the building were $L_{A90,5min}$ 44 dB during the daytime and $L_{A90,5min}$ 41 dB at night.

Based on the requirements of the London Borough of Camden, the relevant plant noise limits at the worst affected existing noise sensitive premises to the rear of High Holborn House would be L_{Aeq} 39 dB during the day and L_{Aeq} 36 dB at night. These limits are cumulative and apply with all plant operating under normal conditions.

The noise levels from all proposed new plant have been predicted at the most affected sensitive receiver. It is considered that the requirements of the London Borough of Camden will be achieved at all times.

Appendix A

Equipment calibration information

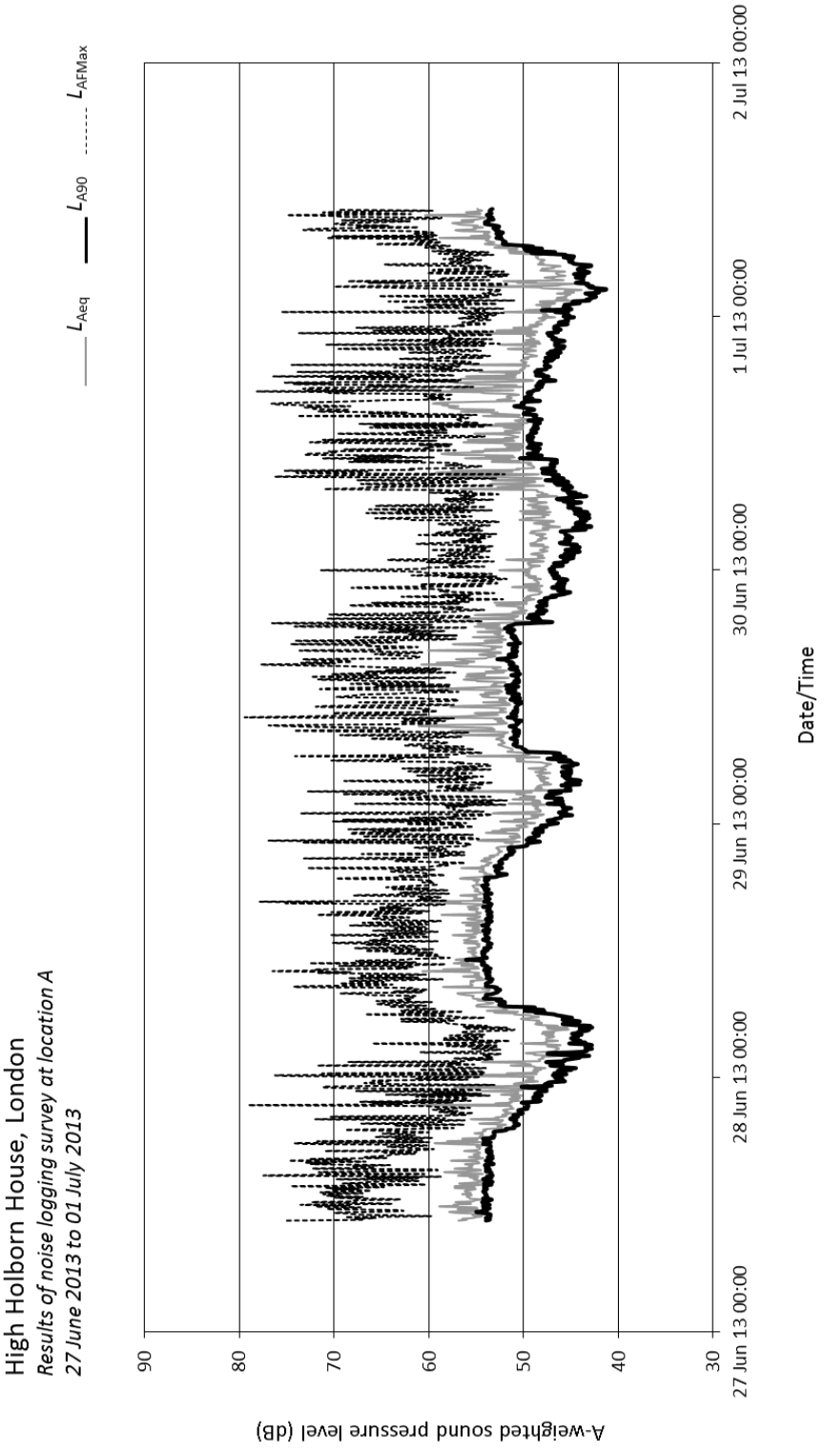
Table A1 Equipment calibration data

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Sound level meter	NL-52/00320633	Rion	12 Apr 14	1204155
Microphone	UC-59/03382	Rion	12 Apr 14	1204155
Calibrator	N7-74/34125430	Rion	12 Apr 14	1204151

Calibration of the sound level meter used for the unattended noise measurements is traceable to national standards. The calibration certificate for the sound level meter used in this survey is available upon request.

Appendix B

Results of unattended measurements at location A


High Holborn House, London
Results of noise logging survey at location A
27 June 2013 to 01 July 2013
L_{Aeq}
L_{A90}
L_{AFMax}
A-weighted sound pressure level (dB)
90
80
70
60
50
40
30
27 Jun 13 00:00
28 Jun 13 00:00
29 Jun 13 00:00
30 Jun 13 00:00
1 Jul 13 00:00
2 Jul 13 00:00
Date/Time