

SANDY BROWN

Consultants in Acoustics, Noise & Vibration

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Seaforth Land

Acoustic planning report

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Version	Date	Comments	Author	Reviewer
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Summary

Sandy Brown has been commissioned by Seaforth Land Holdings Limited to provide acoustic advice in relation to the proposed plant installation at the office of Seaforth Land Holdings Limited, 29-31 Saffron Hill, London EC1N 8SW.

An environmental noise survey has been carried out to determine the existing background sound levels in the area and to set appropriate plant noise limits in line with the requirements of the London Borough of Camden.

This report outlines the details and results of the survey alongside an assessment of the potential impact of the proposed plant items.

The proposed plant items consist of two condenser units which will be installed on the roof of the offices of Seaforth Land Holdings Limited.

The noise survey was undertaken between 12:42 on 16 May 2018 and 12:57 on 22 May 2018.

The representative facade incident background sound level measured during the survey was $L_{A90,15min}$ 58 dB during daytime operational hours (08:00 – 18:00).

Based on the requirements of the London Borough of Camden and the results of the noise survey, all plant must be designed such that the cumulative noise level at 1 m from the worst affected windows of the nearby noise sensitive premises does not exceed $L_{Ar,15min}$ 48 dB during daytime operational hours. These limits are cumulative and apply with all plant operation under normal conditions.

The assessment of the proposed plant items complies with the relevant noise limits.

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1 Introduction

Sandy Brown has been commissioned by Seaforth Land Holdings Limited to provide acoustic advice in relation to the proposed plant installation at the office of Seaforth Land Holdings Limited, 29-31 Saffron Hill, London, EC1N 8SW.

As part of this, an environmental noise survey is required, the purpose of which is to establish the existing background noise levels in the vicinity of the nearby noise sensitive premises and to set appropriate limits for noise egress from building services plant.

This report presents the survey method, results of the environmental noise survey, and a discussion of acceptable limits for noise emission from building services plant. An assessment of noise emissions from the proposed units is also provided.

2 Site description

2.1 The site and its surrounding

The site location in relation to its surroundings is shown in Figure 1 and is highlighted in red. The offices of Seaforth Land Limited are located on Saffron Hill, with Farringdon Road, St Cross Street and Greville Street to the east, north and south respectively.



Figure 1 Site map (courtesy of Google Earth Pro)

2.2 Adjacent premises

The surrounding receptors are primarily commercial and residential. Commercial premises are a mix of offices, shops, restaurants and bars. The nearest noise sensitive receptors are considered to be the adjacent residential premises situated along Farringdon Road approximately 5 m east of the site (highlighted in yellow in Figure 1).

3 Proposed new plant items

All plant will only operate during working hours (08:00 – 18:00) and will not operate outside of this period.

It is proposed that two condenser units are installed on the roof of the current premises.

The location of the proposed plant items is shown in Figure 2, highlighted in red.

The plant noise assessment assumes the distance between the location of the proposed plant items and the nearest noise sensitive receptor as 17 m.

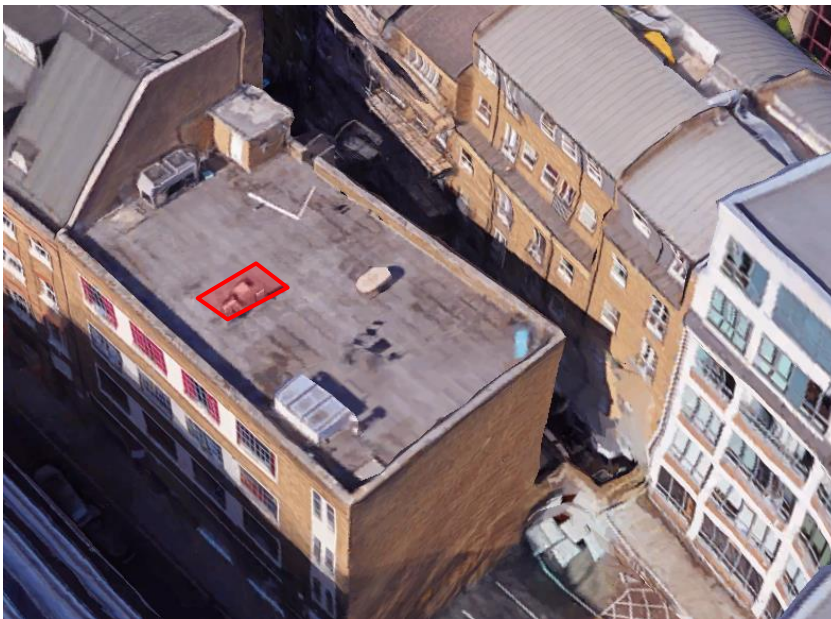


Figure 2 Image showing the location of proposed plant items in relation to the nearest noise sensitive receptor (image courtesy of Google Earth Pro)

4 Method

Details of the equipment used, the noise indices and the weather conditions during the survey are provided in Appendix A. Further information on the specific survey method is provided in this section.

4.1 Unattended measurements

Unattended noise monitoring was undertaken at the site over 5 days to determine the existing background noise levels in the vicinity of nearby noise sensitive premises.

The unattended measurements were performed over 15-minute periods between 12:42 on 16 May 2018 and 13:57 on 22 May 2018. The equipment was installed and collected by Ruairidh Carpenter.

The measurement position used during the survey is indicated in Figure 1, denoted by the letter 'L'. A photograph showing the measurement location is provided in Figure 3.

The microphone was located on the mezzanine balcony to the rear of the site and was positioned at least 3.5 m away from the nearest reflective surface and 1.5 m from the ground. This location was chosen to be reasonably representative of the noise levels experienced by the nearest noise sensitive premises and is considered free field.



Figure 3 Photograph showing unattended noise logger position

5 Measurement results

5.1 Observations

The dominant noise sources observed at the site during the survey consisted of plant noise from units contained within the area.

Less significant noise sources included traffic and pedestrian noise from Saffron Hill.

5.2 Unattended measurement results

The results of the unattended noise measurements are summarised in the following tables. A graph showing the results of the unattended measurements is provided in Appendix B.

The day and night time ambient noise levels measured during the unattended survey are presented in Table 1. These are free-field noise levels.

Table 1 Ambient noise levels measured during the survey

Date	Daytime (07:00 – 23:00)	Night (23:00 – 07:00)
	$L_{Aeq,16h}$ (dB)	$L_{Aeq,8h}$ (dB)
16 May 2018	*	58
17 May 2018	61	58
18 May 2018	60	56
19 May 2018	58	57
20 May 2018	58	56
21 May 2018	59	56
Average	59	57

* Measurement not made over full period due to monitoring start and end time; not included in the average

In line with BS 4142:2014, for the purpose of analysis and establishing representative background sound levels, day and night time typical levels have been quantified using statistical analysis from the continuous logging measurements.

Statistical analysis of representative values for the site are given in Figure 4.

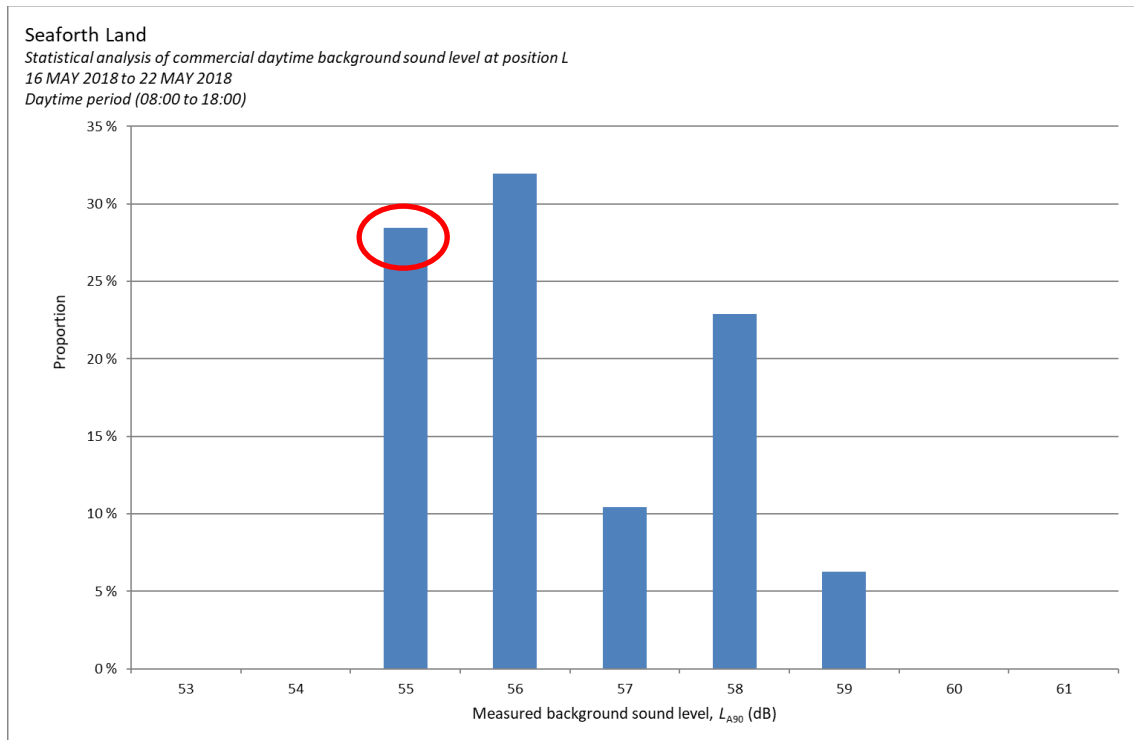


Figure 4 Representative background noise levels

From this analysis, the representative background sound level measured during the survey was $L_{A90,15min}$ 55 dB during daytime operational hours (0800-1800) as a free-field level which equates to 58 dB at 1 m from the facade.

6 Building services noise egress limits

6.1 Standard guidance

Guidance for noise emission from proposed new items of building services plant is given in BS 4142: 2014 'Methods for rating and assessing industrial and commercial sound'.

BS 4142 provides a method for assessing noise from items such as building services plant against the existing background sound levels at the nearest noise sensitive.

BS 4142 suggests that if the noise level is 10 dB or more higher than the existing background sound level, it is likely to be an indication of a significant adverse impact. If the level is 5 dB above the existing background sound level, it is likely to be an indication of an adverse impact. If the level does not exceed the background level, it is an indication of having a low impact.

If the noise contains 'attention catching features' such as tones, bangs etc, a penalty, based on the type and impact of those features, is applied.

6.2 Local Authority criteria

In line with the requirements of the London Borough of Camden (LBC), set out in 'Camden Local Plan, Adoption version' June 2017, when performing the industrial and commercial noise sources assessment the BS 4142:2014 'Methods for rating and assessing industrial and commercial sound' is to be used. This guidance is discussed in Section 6.1.

'Camden Local Plan, Adoption version' June 2017 also states that the rating level of new plant must be 10 dB below the background noise. The representative background noise levels are assessed in accordance with BS 4142:2014.

6.3 Limits

6.3.1 Plant noise limits

The noise survey data obtained was under free-field conditions. This has been corrected to a facade incident level at 1 m from the building, by adding 3 dB.

Based on the above criteria and the measurement results, the cumulative noise level resulting from the operation of all new plant at 1 m from the worst affected windows of the nearest noise sensitive premises should not exceed the limits set out in Table 2.

Table 2 Plant noise limits at 1 m from the nearest noise sensitive premises

Time of day	Maximum sound pressure level at 1 m from noise sensitive premises ($L_{Aeq,15min}$ dB)
Daytime operation (08:00-18:00)	48

7 Assessment

7.1 Proposed plant items

The assessment has been based on broadband sound power levels operating between 08:00 and 18:00. This is based on drawings and specifications received on Friday 1 June 2018 and Tuesday 12 June 2018 respectively.

Table 3 Noise data of proposed units

Unit	Sound power level (L_w) during cooling (dBA)
Samsung UG4T200FUA45G outdoor unit	69

Full calculation stages are provided in Appendix C.

7.2 Assessment

Based on the distance from the plant to the nearest noise sensitive receptor and the sound power levels provided, the cumulative noise from all plant items operating is L_{Aeq} 42 dB during the day at the nearest noise sensitive receptor.

A full breakdown of calculations is provided in Appendix C. This level complies with the daytime noise limit of $L_{Ar,T}$ 48 dB.

8 Conclusion

A noise survey has been carried out to determine the existing background sound levels in the vicinity of the site and surrounding noise sensitive premises. The representative facade incident background sound levels were $L_{A90,15min}$ 58 dB during plant operation hours.

On the basis of the requirements of the Local Authority, the relevant plant noise limits at the worst affected existing noise sensitive premises would be $L_{Ar,T}$ 48 dB during daytime operation.

An initial assessment of the proposed plant items associated with the development has been carried out. Based on this, the proposed plant items comply with the relevant noise limits.

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Appendix A - Survey details

Equipment

A Rion NL-32 sound level meter was used to undertake the unattended measurements. The calibration details for the equipment used during the survey are provided in Table A1.

Table A1 Equipment calibration data

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Sound level meter	NL-32/00623769	Rion	06 Oct 19	TCRT17/1656
Microphone	UC-53A/319244	Rion	06 Oct 19	TCRT17/1656
Pre-amp	NH-21/36677	Rion	06 Oct 19	TCRT17/1656
Calibrator	NC-74/34336009	Rion	05 Oct 19	TCRT17/1649
Sound level meter	NL-32/00623769	Rion	06 Oct 19	TCRT17/1656

Calibration of the sound level meters used for the tests is traceable to national standards. The calibration certificates for the sound level meter used in this survey are available upon request.

The sound level meters and microphones were calibrated at the beginning and end of the measurements using their respective sound level calibrators. No significant deviation in calibration occurred.

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 with a fast time weighting.
- $L_{A90,T}$ The A-weighted sound pressure level exceeded for 90% of the measurement period. Indicative of the background sound level.

The L_{A90} is considered most representative of the background sound 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 BS7445: Part 1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures.*

Weather conditions

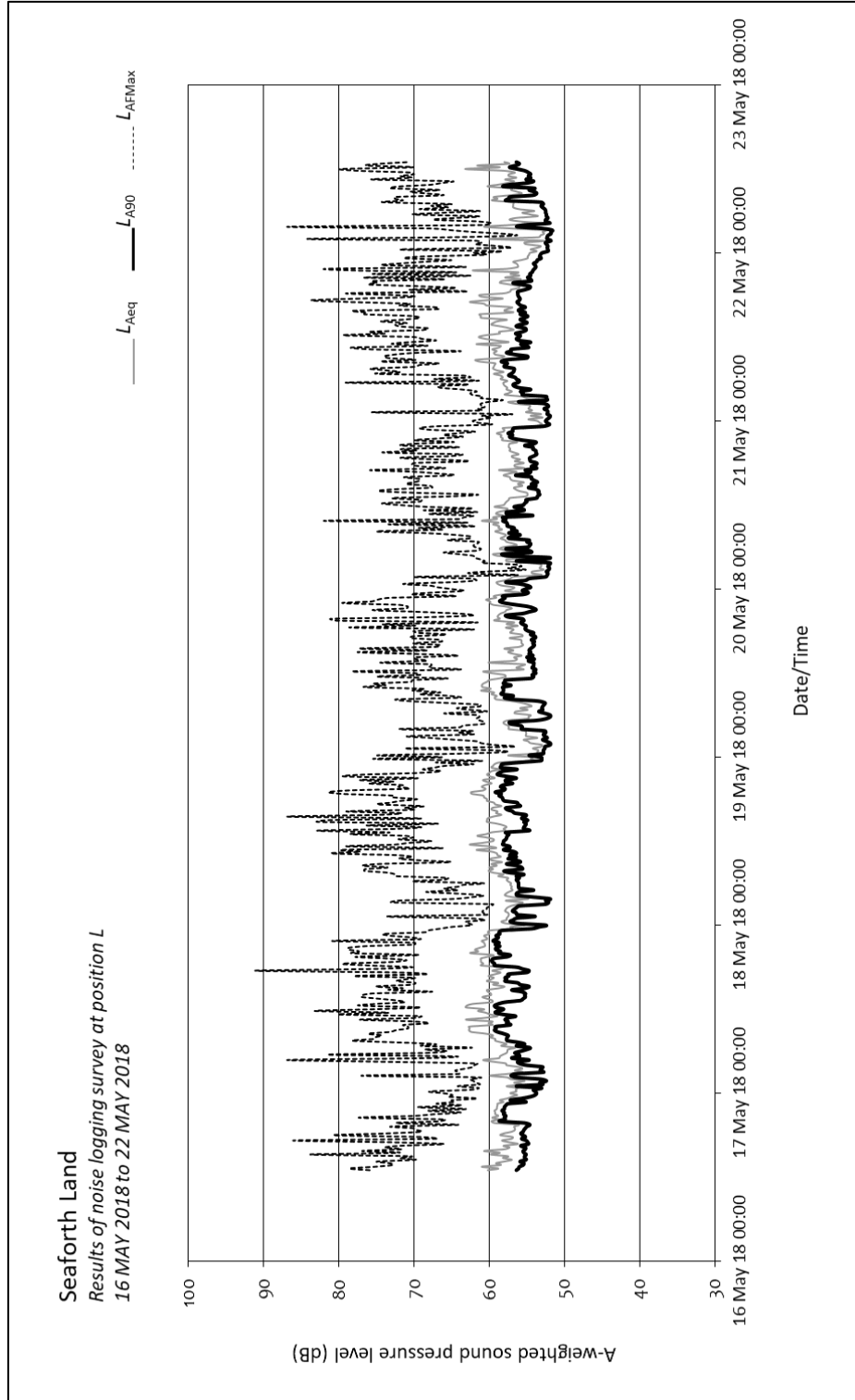
During the unattended noise measurements between 16 May 2018 and 22 May 2018, weather reports for the area indicated that temperatures varied between 7°C at night and 23°C during the day, and the wind speed was less than 5 m/s.

These weather conditions are considered suitable for obtaining representative measurements.

Appendix B - Results of unattended measurements at Location L

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Appendix C - Plant noise calculation stages

Comments	Octave band centre frequency (Hz)								Rating 1	Rating 2
	63	125	250	500	1k	2k	4k	8k		

Seaforth Land [18224]

Plant noise assessment to nearest noise sensitive receptors
(Residential on Farringdon Rd)

Summary

Lp, Farringdon Road 42

Calc (Normal operation)

Finding sound pressure level (Lp) at receptor

$$L_p = L_w - 20\log(r) + 10\log(Q) - 11$$

r = distance (m), Q = directivity factor

Source A (Samsung 360) to Farringdon road residential

SWL of unit	69
20log(r) [r = 17 m]	-25
10log(Q) [Q = 2]	3
-11	-11
Facade correction	3
Lp, source A	39

Source B (Samsung 360) to Farringdon road residential

SWL of unit	69
20log(r) [r = 17 m]	-25
10log(Q) [Q = 2]	3
-11	-11
Facade correction	3
Lp, source A	39

Lp, combined, facade (receiver A) 42

Criteria 48