

SANDY BROWN

Consultants in Acoustics, Noise & Vibration

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20-23 Greville Street

Planning noise survey report

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Version	Date	Comments	Author	Reviewer
A	12 Jan 18		Robert Conetta	Richard King

Summary

Sandy Brown has been commissioned Seaforth Land to provide acoustic advice in relation to the proposed development at 20-23 Greville Street.

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.

The noise survey was performed between 13:25 01 November 2017 and 11:55 08 November 2017.

The representative weekday background sound levels measured during the survey were $L_{A90,15min}$ 51 dB during the daytime, and $L_{A90,15min}$ 47 dB at night. The representative weekend background sound levels measured during the survey were $L_{A90,15min}$ 49 dB during the daytime, and $L_{A90,15min}$ 46 dB at night.

Based on the requirements of the London Borough of Camden and on 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 the following facade corrected limits:

Weekday:-

- $L_{Aeq,15min}$ 44 dB during the daytime (07:00 – 23:00)
- $L_{Aeq,15min}$ 40 dB during the night (23:00 – 07:00)

Weekend:-

- $L_{Aeq,15min}$ 42 dB during the daytime (07:00 – 23:00)
- $L_{Aeq,15min}$ 39 dB during the night (23:00 – 07:00)

These limits are cumulative, and apply with all plant operation under normal conditions. If plant items contain tonal or attention catching features, a penalty based on the type and impact of those features will be applied, and the limits will be more stringent than those set.

Cumulative noise breakout from the proposed A1 / A3 units should not exceed $L_{Aeq,5min}$ 61 dB during the daytime hours and $L_{Aeq,5min}$ 53 dB during night time hours, at the facade of the nearest noise sensitive premises. Based on the proposed layouts and reasonable assumptions on the operation, cumulative noise breakout levels from these units are not expected to exceed these limits at any time.

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1 Introduction

Sandy Brown has been commissioned by Seaforth Land to provide acoustic advice in relation to the proposed development at 20-23 Greville Street.

The proposed development will comprise the change of use of existing Class B1 at ground floor, basement and first floor levels to Class A1 / A3 use; demolition of existing fifth floor plant room and construction of rooftop extension at fifth and mezzanine floor level for Class B1 use, rear infill extension to all floors for Class B1 use, external alterations including new facade and glazing, and associated works.

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

An initial assessment of noise breakout from the A1 / A3 units to the nearest noise sensitive premises has also been undertaken.

This report presents the survey method, results of the environmental noise survey, a discussion of acceptable limits for noise emission from building services plant, and an assessment of the noise breakout from the A1 / A3 units.

2 Site description

2.1 The site and its surrounding

The site is located at 20-23 Greville Street, which is a commercial building. It is shown in red on Figure 1. The site is bound by Greville Street to the north and Saffron Hill to the east. Farringdon Road is approximately 100 m east from the site.

The site location in relation to its surroundings is shown in Figure 1. The site is located in mixed use area, with commercial properties located on the lower floors and residential properties on higher floors of many buildings.

Figure 1 shows the site with the building types marked as follows:

- Yellow – residential premises
- Blue - office buildings
- Green - mostly residential, with commercial use areas on the ground and lower floors
- Orange - Crossrail construction site
- Light blue - Anglia Ruskin University campus south east of the site.

Bleeding Heart Yard is south and west of the site, with a restaurant on the eastern wall of the yard and the Bleeding Heart Tavern on the northern side.

South of the site on top of the Anglo American and De Beers building there is a helicopter landing platform, which will be a dominant short term noise source when the helicopter lands there. No such event occurred during the survey.



Figure 1 Site map (courtesy of Google Earth Pro).

2.2 Adjacent premises

Nearest residential noise sensitive premises are located on the upper floors of surrounding buildings highlighted in yellow on Figure 1. In particular those are: 24 Greville Street and 28 Greville Street, located directly east and north of the site respectively. 25 Farringdon Road east of the site across Saffron Hill, also has noise sensitive residential premises on the upper floors.

3 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.

3.1 Unattended measurements

Unattended noise monitoring was undertaken at the site over approximately 8 days to determine the existing background sound levels in the vicinity of nearby noise sensitive premises.

The unattended measurements were performed over 15 minute periods between 13:25 01 November 2017 and 11:55 08 November 2017. The equipment was installed by Robert Conetta and Artem Khodov and collected by Artem Khodov.

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 Figure 2. This location was chosen to be reasonably representative of the noise levels experienced by the nearest noise sensitive premises.



Figure 2 Equipment location

The meter was installed more than 5 m away from any wall or other vertical reflective surface, and approximately 1.8 m above the roof.

The measurement position is considered to be free field.

4 Measurement results

4.1 Observations

The dominant noise sources observed at the site during the survey consisted of noise from road traffic on Farringdon Road to the east of the site, and noise from pedestrians on Greville Street to the north. There was a large amount of mechanical services plant on adjacent roofs.

Less significant noise sources included frequent distant commercial aircraft.

During the weekend evenings, from 4 November 2017 to 5 November 2017 fireworks may impact the noise measurement results.

4.2 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.

The measurements were performed in free field conditions.

Table 1 Ambient noise levels measured during the survey

Date	Daytime (07:00 – 23:00) $L_{Aeq,16h}$ (dB)	Night (23:00 – 07:00) $L_{Aeq,8h}$ (dB)
Wednesday 1 November 2017	*	50
Thursday 2 November 2017	55	53
Friday 3 November 2017	55	50
Saturday 4 November 2017	60	52
Sunday 5 November 2017	55	51
Monday 6 November 2017	56	51
Tuesday 7 November 2017	57	52
Wednesday 8 November 2017	*	
Average	56	51

* Measurements not made over full period due to monitoring start and end time (the measurement on 1 November 17 was over 9 hours, and on 8 November 17 over 5 hours); 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.

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Based on the time profile graph given in Appendix B the measured background noise levels, in the vicinity of 20-23 Greville Street, are significantly different, between weekdays and weekends.

Weekday and weekend, daytime and night time statistical analysis of representative values for the site are given in Figure 3 and Figure 6.

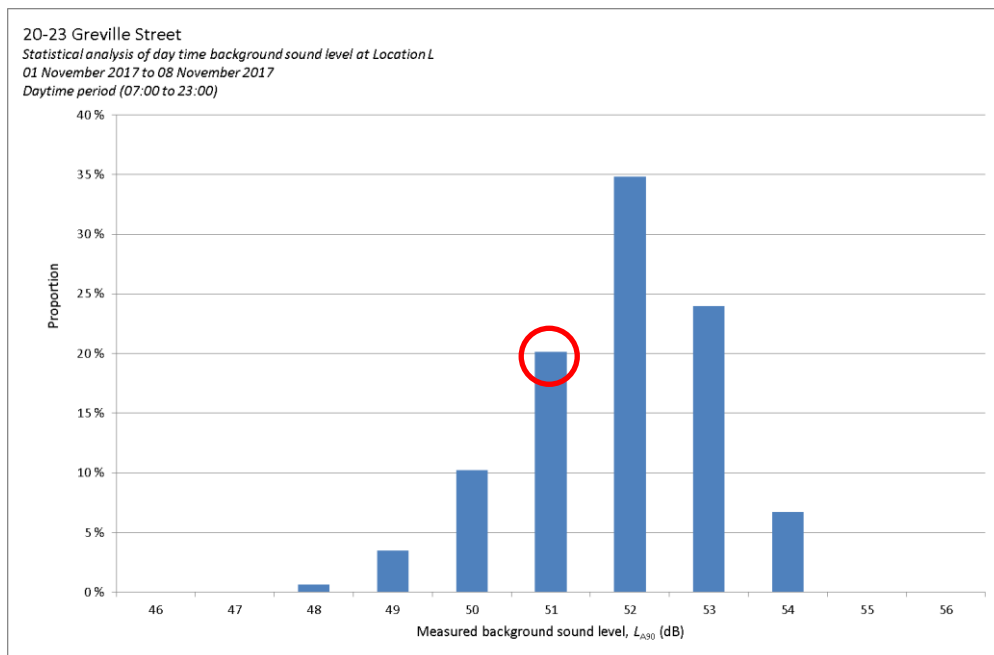


Figure 3 Weekday: statistical analysis of daytime background sound level at location L

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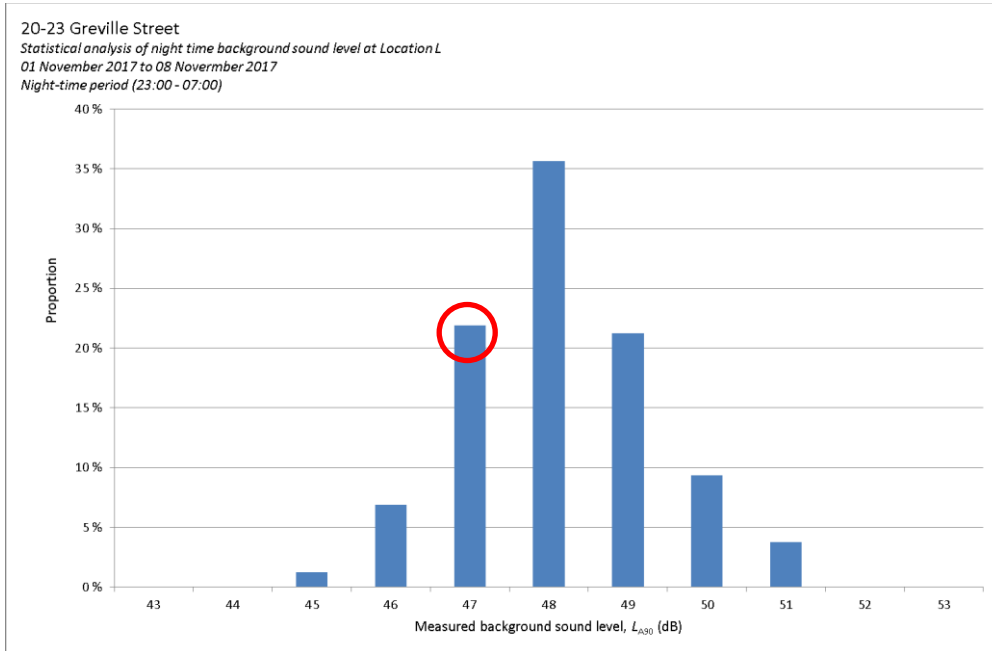


Figure 4 Weekday: statistical analysis of night time background sound level at location L

From this analysis, the representative background sound levels measured during the survey were $L_{A90,15min}$ 51 dB during the daytime and $L_{A90,15min}$ 47 dB at night.

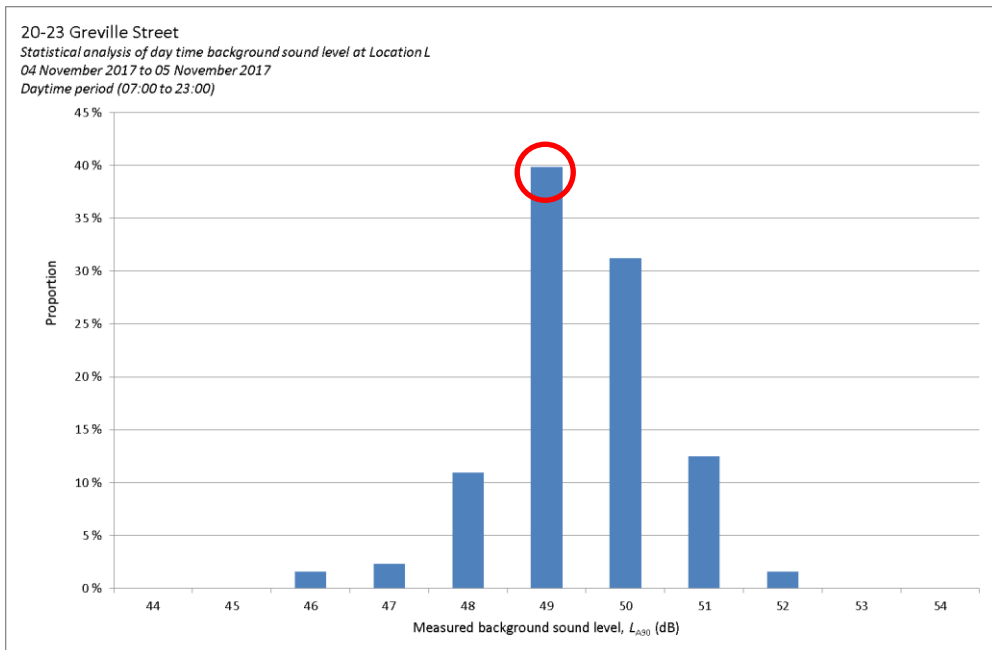


Figure 5 Weekend: statistical analysis of daytime background sound level at location L

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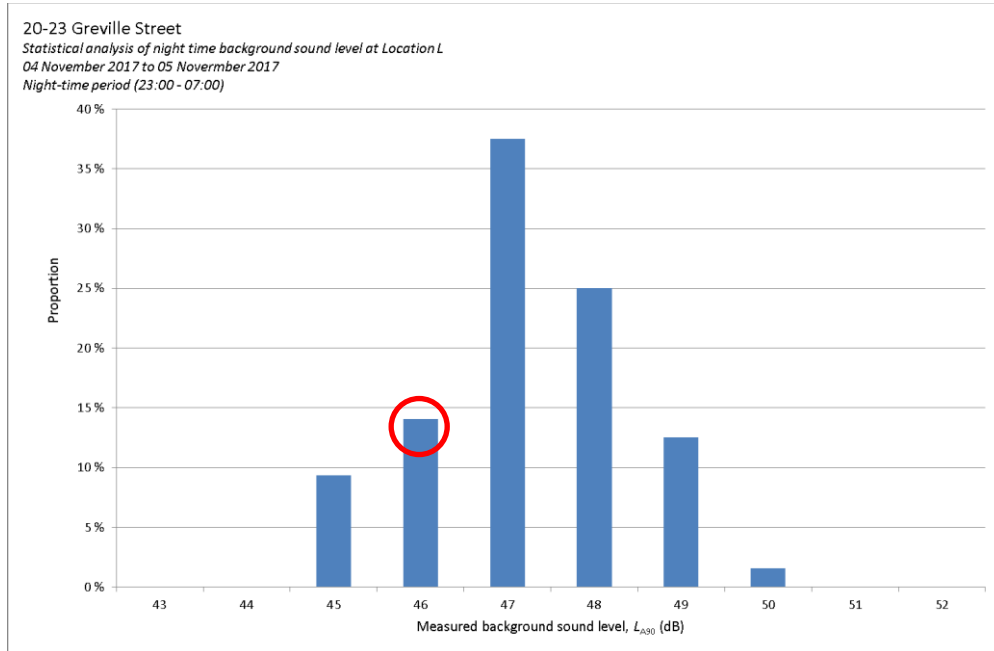


Figure 6 Weekend: statistical analysis of night time background sound level at location L

From this analysis, the representative background sound levels measured during the survey were $L_{A90,15min}$ 49 dB during the daytime and $L_{A90,15min}$ 46 dB at night.

5 Building services noise egress limits

5.1 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.

5.2 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 5.1.

'*Camden Local Plan, Adoption version*' June 2017 also states that the rating level of the new plant must be 10 dB below the background noise. The representative background noise levels are assessed in accordance with BS 4142:2014 in Section 4.2.

5.3 Limits

5.3.1 Basic limits

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 facade corrected 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)
Weekday	
Daytime (07:00-23:00)	44
Night-time (23:00-07:00)	40
Emergency plant testing (09:00-17:00)	64
Weekend	
Daytime (07:00-23:00)	42
Night-time (23:00-07:00)	39
Emergency plant testing (09:00-17:00)	62

Emergency plant will only be tested for up to one hour per month between 09:00 - 17:00 Monday to Friday only and not on public holidays.

The limits set out in Table 2 do not include any attention catching features. The penalties for attention catching features may be significant, and will need to be considered as the building services design progresses. This is discussed further in Section 0.

5.3.2 Attention catching features

If the proposed plant noise contains attention catching features (such as tonal elements, whines, whistles, bangs etc), the plant should be designed to achieve a limit below those set out above, based on the type and impact of the features.

If appropriate, a subjective assessment of the plant features can be adopted. Where the plant noise contains tonal elements, the following corrections can be made depending on how perceptible the tone is at the noise receptor:

- 0 dB where the tone is not perceptible
- 2 dB where the tone is just perceptible
- 4 dB where the tone is clearly perceptible
- 6 dB where the tone is highly perceptible

Where the plant noise is impulsive, the following corrections can be made depending on how perceptible the impulsivity is at the noise receptor:

- 0 dB where the impulse is not perceptible
- 3 dB where the impulse is just perceptible
- 6 dB where the impulse is clearly perceptible
- 9 dB where the impulse is highly perceptible

For noise which is equally both impulsive and tonal, then both features can be taken into account by linearly summing the corrections for both characteristics.

If the plant has other distinctive characteristics, such as intermittency, then a 3 dB correction can be made.

If a subjective assessment is not appropriate then an objective assessment can be made. A noise source is deemed to be tonal if the time averaged sound pressure level in a one-third octave band exceeds the level in adjacent one-third octave bands by the level differences given below:

- 15 dB in the low frequency one-third octave bands (25 Hz to 125 Hz)
- 8 dB in the mid frequency one-third octave bands (160 Hz to 400 Hz)
- 5 dB in the high frequency one-third octave bands (500 Hz to 10000 Hz)

If an objective assessment identifies the plant noise to be tonal then a 6 dB correction must be made.

5.4 Assessment

At this stage, no information is available in relation to the proposed installation of building services plant, and this will need to be assessed in detail as the design progresses. However, all plant items will be designed to achieve the plant noise limits set out above, including any corrections for attention catching features.

6 A1 / A3 unit noise breakout

6.1 Local Authority criteria

LBC has no set criteria for the control of noise breakout from A1 / A3 units to nearby noise sensitive premises.

However LBCs ‘Camden Statement of Licensing Policy 2011’ provides guidance for the control of noise breakout from premises providing music. Although this document has recently been superseded, the limits are considered appropriate for the control of noise breakout from the proposed A1 / A3 units.

LBCs ‘Camden Statement of Licensing Policy 2011’ states the following:

‘E. Before 2300 hours, the noise climate of the surrounding area shall be protected such that the A-weighted equivalent continuous noise level (L_{Aeq}) emanating from the application site, as measured one metre from any facade of any noise sensitive premises over any five minute period with entertainment taking place, shall not increase by more than 5dB as compared to the same measure, from the same position, and over a comparable period, with no entertainment taking place.

F. After 2300 hours, the noise climate of the surrounding area shall be protected such that the A-weighted equivalent continuous noise level (L_{Aeq}) emanating from the application site, as measured one metre from any facade of any noise sensitive premises over any five minute period with entertainment taking place shall not increase by more than 3dB as compared to the same measure, from the same position, and over a comparable period, with no entertainment taking place;..’

6.2 A1 / A3 breakout limits

Based on the requirements set out above and the results of the environmental noise survey, the noise breakout level from the operation of the proposed A1 / A3 units at 1 m from the worst affected windows of the nearest noise sensitive premises should not exceed the facade corrected limit set out in Table 3.

Table 3 A1/A3 unit breakout 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 ($L_{Aeq,5min}$ dB)
Daytime (07:00-23:00)	61
Night time (23:00-07:00)	53

6.3 Noise breakout assessment

At this stage, only indicative design information for the proposed development is available. Current floor plans for the A1 / A3 units are given in Appendix C.

The following assumptions, set out in Table 4 have been made with respect to the operation of the proposed A1 / A3 units.

Table 4 A1 / A3 operation assumptions

	Assumption
Operational hours	24 hours
Operational noise level limit	Do not exceed $L_{Aeq,5min}$ 80 dB at any time
Minimum glazing requirements	3 mm single glazed units
All doors (entrance / patio / fire exit)	Closed, specified to achieve R_w 30 dB
Unit B patio doors	May be opened during operational hours

The operational noise level set out in Table 4 are representative of noise levels in a busy, densely packed restaurant and is therefore appropriate .

If it is anticipated that this limit might be exceeded regularly then, some element of noise control (eg, absorption, soft furnishings, or sound insulation enhancements) would be required to avoid disturbance to occupants of the nearby noise premises and adjacent B1 office units within the development.

Noise breakout levels have been assessed to the worst affected noise sensitive premises. These are:

- Bleeding Heart Yard
- 28 Greville Street

Calculated noise levels at 1 m from the facade of each noise sensitive receptor from each A1 / A3 unit, together with their cumulative level are given in Table 5 to

Table 6 respectively.

The calculated noise levels are inclusive of any sound reduction provided by the facade of the proposed development and acoustic screening, provided between the source and the receptor.

Full calculation stages are given in Appendix D.

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Table 5 Calculated sound pressure levels at Bleeding Heart Yard

A1 / A3 unit name	Calculated noise level L_{Aeq} (dB)	
		Patio doors open
Unit A	26	26
Unit B	21	43
Unit C	21	21
Cumulative noise level at Bleeding Heart Yard	28	43

Table 6 Calculated sound pressure levels at 28 Greville Street

A1 / A3 unit name	Calculated noise level L_{Aeq} (dB)
Unit A	38
Unit B	35
Unit C	35
Cumulative noise level at 28 Greville Street	41

Cumulative noise levels at the facade of 28 Greville Street will increase momentarily to L_{Aeq} 53 dB when entrance doors are opened for patrons.

7 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 weekday background sound levels measured during the survey were $L_{A90,15min}$ 51 dB during the daytime, and $L_{A90,15min}$ 47 dB at night. The representative weekend background sound levels measured during the survey were $L_{A90,15min}$ 49 dB during the daytime, and $L_{A90,15min}$ 46 dB at night.

Based on the requirements of the London Borough of Camden and on 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 the following facade corrected limits:

Weekday:-

- $L_{Aeq,15min}$ 44 dB during the daytime (07:00 – 23:00)
- $L_{Aeq,15min}$ 40 dB during the night (23:00 – 07:00)

Weekend:-

- $L_{Aeq,15min}$ 42 dB during the daytime (07:00 – 23:00)
- $L_{Aeq,15min}$ 39 dB during the night (23:00 – 07:00)

These limits are cumulative, and apply with all plant operating under normal conditions. If plant items contain tonal or attention catching features, the limits will be more stringent than those set out above. If plant items contain tonal or have attention catching features, a penalty based on the type and impact of those features indicated in Section 0 will be applied, and the limits will be more stringent than those set out above.

Cumulative noise breakout from the proposed A1 / A3 units should not exceed $L_{Aeq,5min}$ 61 dB during the daytime hours and $L_{Aeq,5min}$ 53 dB during night time hours, at the facade of the nearest noise sensitive premises. Based on the proposed A1 / A3 units layouts and reasonable assumptions on the operation, cumulative noise breakout levels from these units are not expected to exceed these limits at any time.

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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-32/00623761	Rion	06 Oct 19	TCRT17/1654
Microphone	UC-53A/319233	Rion	06 Oct 19	TCRT17/1654
Pre-amp	NH-21/36669	Rion	06 Oct 19	TCRT17/1654
Calibrator	NC-74/34536129	Rion	05 Oct 19	TCRT17/1650

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 01 November 2017 and 08 November 2017, weather reports for the area indicated that temperatures varied between 5°C at night and 12°C during the day, and the wind speed was less than 5 m/s.

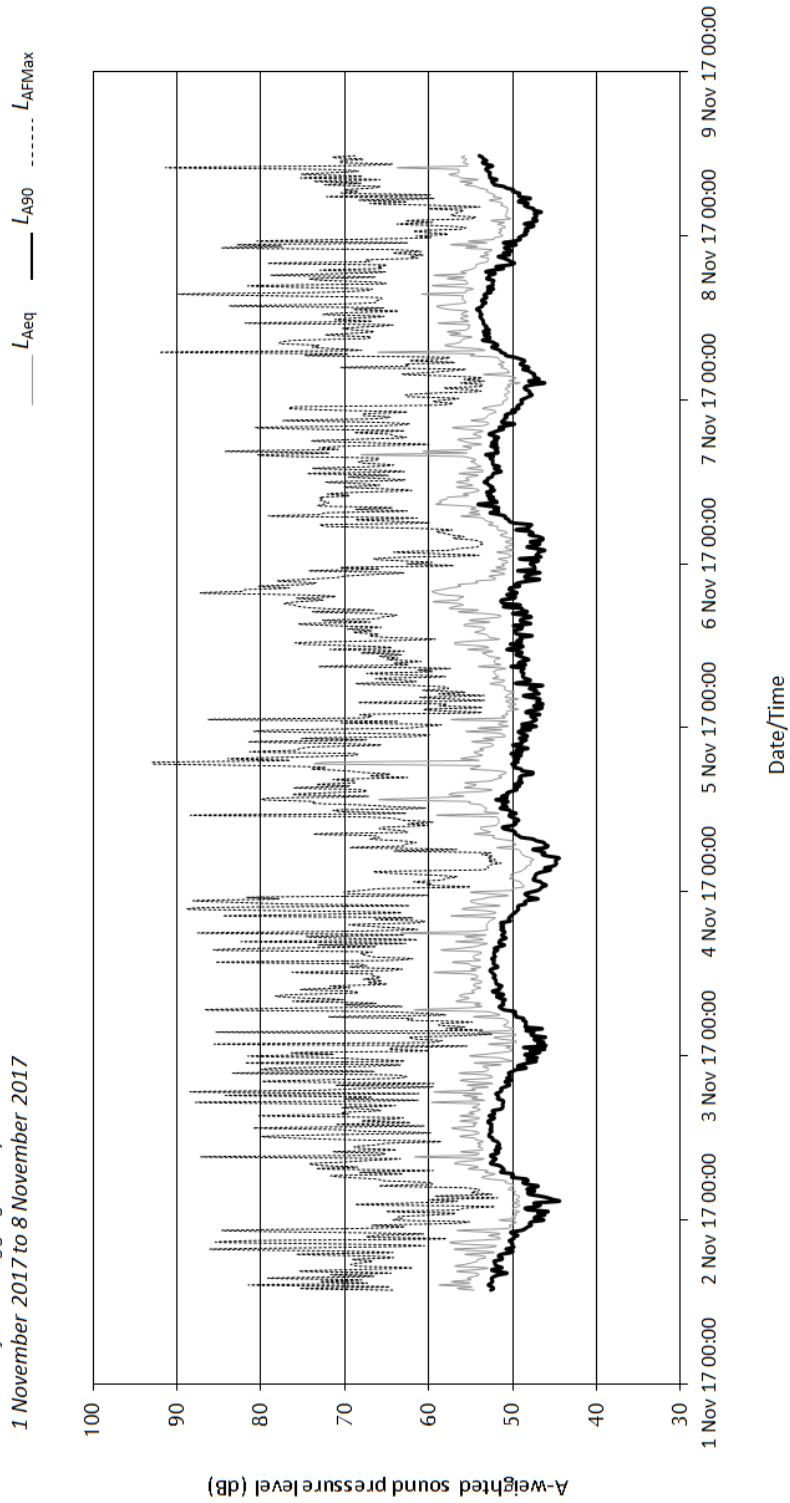
These weather conditions are considered suitable for obtaining representative measurements.

Appendix B – Results of unattended measurements at Location L

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20-23 Greville Street
Results of noise logging survey at Location L
1 November 2017 to 8 November 2017



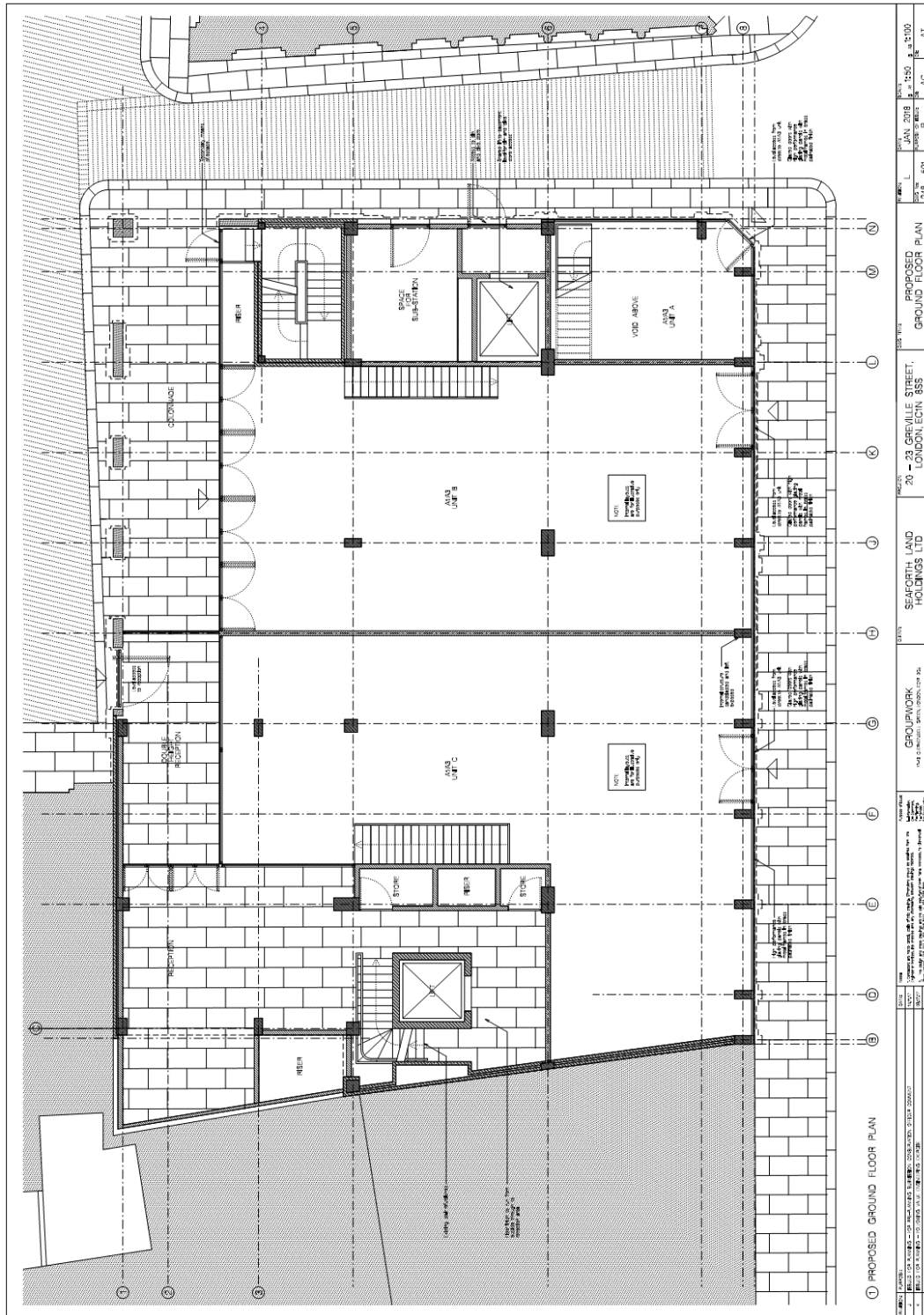
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Appendix C – A1 / A3 unit floor plans

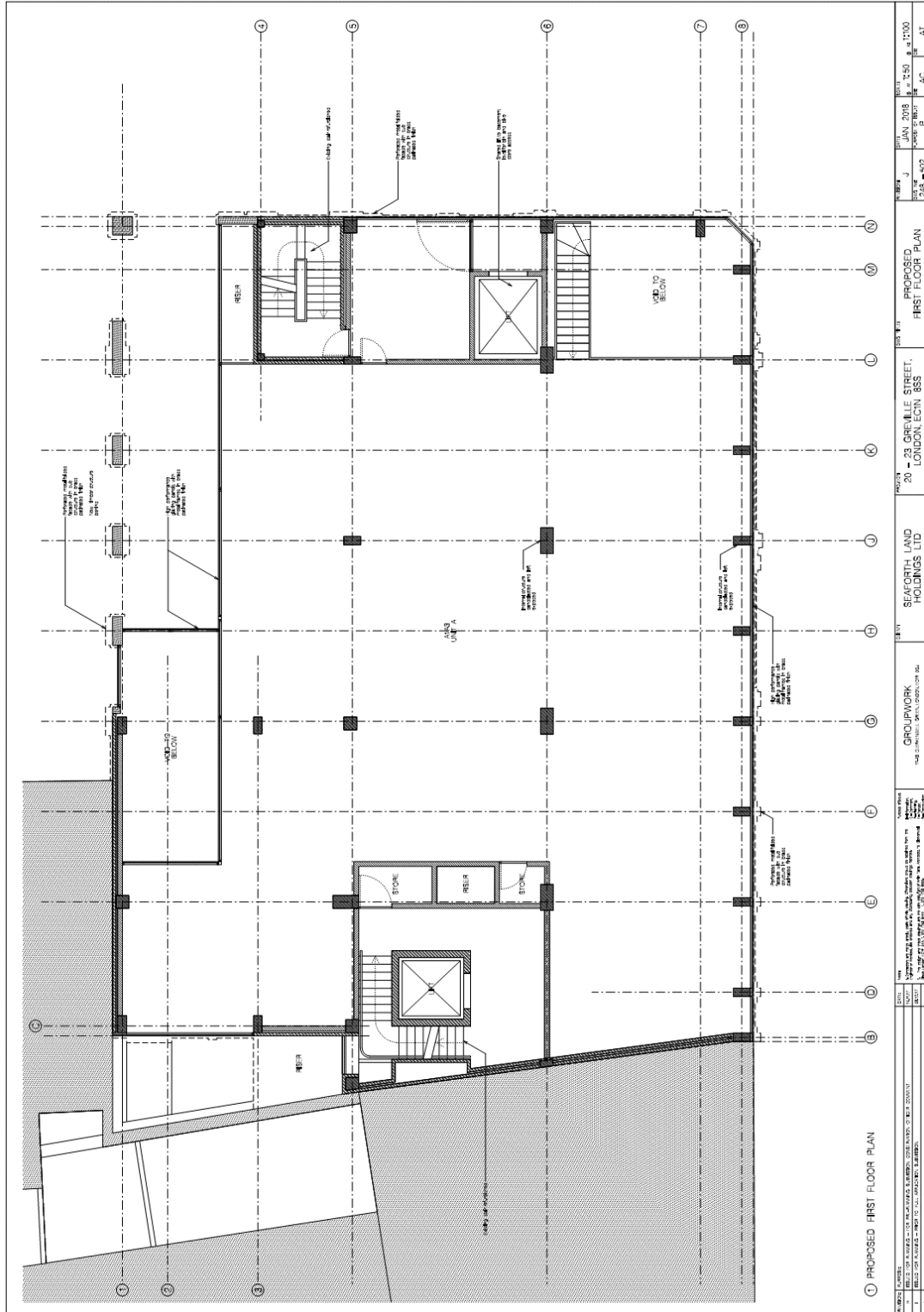
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Appendix D – A1 / A3 noise breakout calculations

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Comments	Octave band centre frequency (Hz)								Rating 1	Rating 2
	63	125	250	500	1k	2k	4k	8k		
12/01/18 RC										
17483 - 20-23 Greville Street										
A1/A3 unit - noise breakout assessment										
Breakout noise limits at 1m from noise sensitive facade										
Daytime (07:00-23:00)									L _A =	61
Night time (23:00-07:00)									L _A =	53
Bleeding Heart Yard										
<i>Using L2 = L1-R+10log(S)-20log(r)-14</i>										
<u>Unit A</u>										
A1/A3 noise limit Lp(rev)	70	70	75	75	75	75	75	70	L _A =	81
Glazing 3mm single glazed	13	15	20	23	29	34	28	28	X _w =	28
10log(S) [S=30]	15	15	15	15	15	15	15	15		
20log(r) [r=16m]	-22	-22	-22	-22	-22	-22	-22	-22		
Barrier atten (PD = 0.107m)	-5.7	-6.3	-7.3	-9.0	-11.3	-14.0	-17.0	-20.0		
-14	-14	-14	-14	-14	-14	-14	-14	-14		
Facade correction	3	3	3	3	3	3	3	3		
L2 @ 1m from noise sensitive facade	33	30	29	25	16	9	12	4	L _A =	26
<u>Unit B and C</u>										
A1/A3 noise limit Lp(rev)	70	70	75	75	75	75	75	70	L _A =	81
Glazing 3mm single glazed	13	15	20	23	29	34	28	28	X _w =	28
10log(S) [S=15]	12	12	12	12	12	12	12	12		
20log(r) [r=16m]	-24	-24	-24	-24	-24	-24	-24	-24		
Barrier atten (PD = 0.107m)	-5.7	-6.3	-7.3	-9.0	-11.3	-14.0	-17.0	-20.0		
-14	-14	-14	-14	-14	-14	-14	-14	-14		
2 x A1/A3 units	3	3	3	3	3	3	3	3		
Facade correction	3	3	3	3	3	3	3	3		
L2 @ 1m from noise sensitive facade	31	28	27	23	14	7	10	2	L _A =	24
L2 (sum)	35	32	31	27	18	11	14	6	L _A =	28
A-weighting curve	-26	-16	-9	-3	0	1	1	-1		
	9	16	23	24	18	12	15	5		
<i>Using L2 = L1-R+10log(S)-20log(r)-14</i>										
<u>Unit B</u>										
A1/A3 noise limit Lp(rev)	70	70	75	75	75	75	75	70	L _A =	81
Patio doors open	0	0	0	0	0	0	0	0	X _w =	1
10log(S) [S=15]	12	12	12	12	12	12	12	12		
20log(r) [r=16m]	-24	-24	-24	-24	-24	-24	-24	-24		
Barrier atten (PD = 0.107m)	-5.7	-6.3	-7.3	-9.0	-11.3	-14.0	-17.0	-20.0		
-14	-14	-14	-14	-14	-14	-14	-14	-14		
1 x A1/A3 units	0	0	0	0	0	0	0	0		
Facade correction	3	3	3	3	3	3	3	3		
L2 @ 1m from noise sensitive facade	38	37	41	40	37	35	32	24	L _A =	43
A-weighting curve	-26	-16	-9	-3	0	1	1	-1		
	12	21	33	36	37	36	33	23		

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28 Greville Street

Using $L_2 = L_1 - R + 10\log(S) - 20\log(r) - 14$

Unit A

A1/A3 noise limit $L_p(\text{rev})$	70	70	75	75	75	75	75	70	$L_A =$	81
Glazing 3mm single glazed	13	15	20	23	29	34	28	28	$X_w =$	28
$10\log(S)$ [S=30]	15	15	15	15	15	15	15	15		
$20\log(r)$ [r=10m]	-20	-20	-20	-20	-20	-20	-20	-20		
-14	-14	-14	-14	-14	-14	-14	-14	-14		
Facade correction	3	3	3	3	3	3	3	3		
L2 @ 1m from noise sensitive facade	41	39	39	36	30	25	31	26	$L_A =$	38

Unit B and C

A1/A3 noise limit $L_p(\text{rev})$	70	70	75	75	75	75	75	70	$L_A =$	81
Glazing 3mm single glazed	13	15	20	23	29	34	28	28	$X_w =$	28
$10\log(S)$ [S=15]	12	12	12	12	12	12	12	12		
$20\log(r)$ [r=10m]	-20	-20	-20	-20	-20	-20	-20	-20		
-14	-14	-14	-14	-14	-14	-14	-14	-14		
2 x A1/A3 units	3	3	3	3	3	3	3	3		
Facade correction	3	3	3	3	3	3	3	3		
L2 @ 1m from noise sensitive facade	41	39	39	36	30	25	31	26	$L_A =$	38

Lp 2 log sum	44	42	42	39	33	28	34	29	$L_A =$	41
A-weighting curve	-26	-16	-9	-3	0	1	1	-1		
	18	26	33	36	33	29	35	28		

Using $L_2 = L_1 - R + 10\log(S) - 20\log(r) - 14$

Unit A, B and C

A1/A3 noise limit $L_p(\text{rev})$	70	70	75	75	75	75	75	70	$L_A =$	81
Door open	5	5	5	5	5	5	5	5	$X_w =$	6
$10\log(S)$ [S=1.8]	3	3	3	3	3	3	3	3		
$20\log(r)$ [r=10m]	-20	-20	-20	-20	-20	-20	-20	-20		
-14	-14	-14	-14	-14	-14	-14	-14	-14		
3 x A1/A3 units	5	5	5	5	5	5	5	5		
Facade correction	3	3	3	3	3	3	3	3		
L2 @ 1m from noise sensitive facade	41	41	46	46	46	46	46	41	$L_A =$	53
A-weighting curve	-26	-16	-9	-3	0	1	1	-1		
	15	25	38	43	46	48	47	40		