

# SweetTree Home Care **Services** 2-3 Coleridge Gardens **NW6 3QH**

# **Noise Impact Assessment**

On behalf of



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### **1.0** Introduction

- 1.1. Noise Solutions Ltd (NSL) has been commissioned by SweetTree Home Care Services to undertake a noise impact assessment of proposed new external air conditioning units serving their offices at Coleridge Gardens, London NW6 3QH.
- 1.2. An environmental sound survey has been undertaken to establish the prevailing background sound pressure levels at a location representative of the sound levels outside the nearest noise sensitive receptors to the site.
- 1.3. A noise impact assessment has been undertaken comparing the calculated plant noise levels at the nearest noise-sensitive receptor with the London Borough of Camden's noise criteria.
- 1.4. A glossary of acoustic terminology is given in Appendix A.

### 2.0 Details of development proposals

- 2.1. The SweetTree Home Care Services offices are located at Coleridge Gardens, London NW6 3QH. Normal office hours are 08.00 to 20.00, with the finance office being occupied only between 09.00 and 17.00.
- 2.2. It is proposed to install four new external air conditioning (AC) units on an area of flat roof adjacent to the office windows, at the rear of the premises. The units serving the main office may operate between 08.00 and 20.00, but the unit serving the finance office will operate only between 09.00 and 17.00. All plant will be switched off between 20.00 and 08.00 hours.
- 2.3. There are a number of commercial premises around the service yard/car park at the rear of the offices, including a laundrette and wine bar, all of which have extensive ventilation and air conditioning plant.
- 2.4. Photographs of the area are shown in **Appendix B**.

### **3.0** Nearest noise sensitive receptors

3.1. The area surrounding the site is a mix of commercial and residential premises. The nearest noise-sensitive receptor (Receptor R1) to the new plant overlooks the flat roof, approximately 7m from the proposed new AC units (location indicated in photograph in Appendix B.



### 4.0 Existing noise climate

- 4.1. An environmental noise survey was undertaken to establish the typical background sound levels at a location representative of the noise climate outside the façades of the nearest noise sensitive receptors to the proposed plant area during the quietest times at which the plant will operate.
- 4.2. The results of the environmental sound survey are summarised in Table 1 below. The full set of measurement results and details of the survey methodology are presented in Appendix C.

Measurement period	Range of recorded sound pressure levels (dB)					
r leasurement pertou	L <sub>Aeq(15mins)</sub>	L <sub>Amax(15mins)</sub>	LA10(15mins)	LA90(15mins)		
All offices fully occupied (09.00 – 17.00 hours)	52-63	66-76	54-64	47-62		
Main office only occupied (08.00-09.00 and 17.00 – 20.00)	49-63	61-80	51-64	45-62		
Offices unoccupied – all plant off (20.00 – 08.00 hours)	40-57	49-76	41-62	38-53		

#### *Table 1 Summary of survey results*

#### Lowest and representative background sound levels

4.3. The lowest background sound level during the period when all four units may operate was L<sub>A90</sub> 47 dB. This level was measured only for the period 16.45-17.00. A histogram analysis of the background sound levels in this period is shown below. It should be noted that for the majority of the operating period (08.15 to 14.30) the background levels are significantly higher, between 60 and 62 dBA. The period where levels are 49 dBA or below begins at 14.30.





4.4. During the periods when only three units may operate the lowest background sound level was L<sub>A90</sub> 45 dB. This level was measured for the periods starting 18.00, 19.15 and 19.45. From 17.00 to 20.00 the background sound levels are in the range 45-47 dB L<sub>A90</sub>; from 08.00 to 09.00, background sound levels are 53 dBA or higher.



A histogram analysis of the background sound levels in this period is shown below.



### 5.0 Plant noise design criteria

#### London Borough of Camden

- 5.1. Section 6 of the Camden Planning Guidance Amenity, published March 2018, gives guidance on noise and vibration.
- 5.2. Clause 6.8 refers noise thresholds within Appendix 3 of the Local Plan and to refers to the principles of No observed effect level (NOEL), Lowest observable adverse effect level (LOAEL) and Significant observed adverse effect level (SOAEL) and defines their meanings. Specifically, in the context of this report, LOAEL is defined as:

The level above which changes in behaviour (e.g. closing windows for periods of the day) and adverse effects on health (e.g. sleep disturbance) and quality of life can be detected.

5.3. SOEAL is defined as:

The level above which adverse effects on health and quality of life occur. This could include psychological stress, regular sleep deprivation and loss of appetite.

5.4. Clause 6.27 states that:

Developments proposing plant, ventilation, air extraction or conditioning equipment and flues will need to provide the system's technical specifications to the council accompanying any acoustic report. "BS4142 Method for rating Industrial and Commercial Sound' contains guidance and standards which should also be considered within the acoustic report.

5.5. Appendix 3 within the Camden Local Plan published 2017 states:

"A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion)."

5.6. Table C of the appendix states the criteria at which development related noise levels will be acceptable:



Table C: Noise levels applicable to prop	posed industrial ar	nd commercial de	evelopment (including	g
plant and machinery)				

Existing Noise sensitive receptor	Assessment Location	Design Period	LOAEL (green)	LOAEL to SOAEL (Amber)	SOAL (Red)
Dwellings**	Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade)	Day	'Rating level' 10dB* below background	'Rating level' between 9dB below and 5dB above background	'Rating level' greater than 5dB above background
Dwellings**	Outside bedroom window (façade)	Night	'Rating level' 10dB* below background and no events exceeding 57dBL <sub>Amax</sub>	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dBL <sub>Amax</sub>	'Rating level' greater than 5dB above background and/or events exceeding 88dBL <sub>Amax</sub>

\*10dB should be increased to 15dB if the noise contains audible tonal elements. (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.

\*\*levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.

5.7. The plant noise data available indicates that the noise from the units is not tonal. In addition, the area is already subject to high levels of services plant noise, particularly between approximately 08.00 and 14.00 hours. It is therefore considered appropriate to exclude the 5dB additional penalty described in the notes to Table C.

# **BS 4142:2014 Methods for rating and assessing industrial and commercial sound**

- 5.8. BS 4142:2014 is intended to be used to assess the likely effects of sound on people residing in nearby dwellings. The scope of BS 4142:2014 includes "sound from fixed plant installations which comprise mechanical and electrical plant and equipment".
- 5.9. The procedure contained in BS 4142:2014 is to quantify the "specific sound level", which is the measured or predicted level of sound from the source in question over a one hour period for



the daytime and a 15 minute period for the night-time. Daytime is defined in the standard as 07.00 to 23.00 hours, and night-time as 23.00 to 07.00 hours.

- 5.10. The specific sound level is converted to a rating level by adding penalties on a sliding scale to account for either potentially tonal or impulsive elements. The standard sets out objective methods for determining the presence of tones or impulsive elements, but notes that it is acceptable to subjectively determine these effects.
- 5.11. The penalty for tonal elements is between 0dB and 6dB, and the standard notes: "Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible."
- 5.12. The penalty for impulsive elements is between 0dB and 9dB, and the standard notes: "Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible."
- 5.13. The assessment outcome results from a comparison of the rating level with the background sound level. The standard states:
  - *Typically, the greater this difference, the greater the magnitude of the impact.*
  - A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
  - A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context;
  - The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.
- 5.14. The standard does state that "adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."
- 5.15. The standard goes on to note that: "Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night."



5.16. In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014 edition places emphasis upon an appreciation of the context, as follows:

"An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context."

5.17. BS 4142:2014 requires uncertainties in the assessment to be considered, and where the uncertainty is likely to affect the outcome of the assessment, steps should be taken to reduce the uncertainty.

#### Notes on BS 4142:2014 and Camden Local Plan Appendix 3

5.18. It should be noted that a plant rating noise level equal to the background sound level would be considered to have a "low impact, depending on the context" using BS 4142, and would fall into the "Amber" category with the Camden Local Plan.

#### 6.0 Plant noise impact assessment

- 6.1. The cumulative plant noise level at the most affected noise sensitive receptors has been predicted, based on the plant noise levels given in **Appendix D**. Predictions include for the effects of directivity, distance and acoustic screening and reflections between the AC units and the identified nearest receptor.
- 6.2. It should be noted that the proposed plant is not anticipated to exhibit any tonal or impulsive characteristics provided it is well maintained. All proposed external plant will be inverter driven and, therefore, will gently ramp up and down depending on the demands on the various systems.

#### BS 4142:2014 noise assessment

6.3. Tables 2 and 3 summarise the results of the assessment at the nearest noise-sensitive receptor. All other nearby receptors benefit from increased distance/screening to the plant. The full set of calculations can be found in **Appendix E.** Assessments of incident sound levels at the nearest windows have been assessed against both the lowest and representative background sound levels during the proposed operating periods.



Results	Using lowest background	Using representative background	When laundry operates	Relevant Clauses of BS4142:201 4	Commentary
Background Sound level	L <sub>A90</sub> = 47dB	L <sub>A90</sub> = 49dB	L <sub>A90</sub> = 60dB	8.1, 8.2	Representative typical background sound level determined from a range of measurements
Assessment mac daytime, so th interval is c	de during the le reference one hour			7.2	
Specific Sound Level	$L_{Aeq,T} = 47 dB$			7.3.6	Incident level at nearest residential window
Acoustic Feature Correction	0dB			9.2	Plant is already a feature in the noise environment
Rating Level		(47+0) dB = 47 dB			
Excess of Rating Level over background sound level	$ \begin{array}{c} (47-47) \ dB = \\ 0 \ dB \end{array}  \begin{array}{c} (47-49) \ dB = \\ -2 \ dB \end{array}  \begin{array}{c} (47-60) \ dB \\ = \\ -13 \ dB \end{array} $			NOTE: This is based on a pe assessment of background le	a worst case, ssimistic representative wels
Assessment of impact:	Low impact, context. Pla feature, and generally mu majority of t plant does no morning o	, depending on ant is already a d plant noise is ch higher for the the period; new ot run early in the r late at night		11	



Results	Using lowest background	Using representative background	Relevant Clauses of BS4142:2014	Commentary
Background Sound level	L <sub>A90</sub> = 45dB	L <sub>A90</sub> = 46dB	8.1, 8.2	Representative typical background sound level determined from a range of measurements
Assessment mac daytime, so the ref is one h	le during the ference interval nour		7.2	
Specific Sound Level	$L_{Aeq,T} = 45 dB$		7.3.6	Incident level at nearest residential window
Acoustic Feature Correction	OdB		9.2	Plant is already a feature in the noise environment
Rating Level	(45+0) c	1B = 45dB		
Excess of Rating Level over background sound level	(45-45) dB = 0dB	(45-46) dB = -1dB	NOTE: This is a on a pessimistic representative b	worst case, based assessment of ackground levels
Assessment of impact:	Low impact, context. Plant is and plant noise generally much does not run ear or late	depending on already a feature, in the evening is higher; new plant rly in the morning at night	11	

Table 3 Period With three units oberailin	Table 3	Period	with	three	units	operatin
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6.4. It should also be noted that for large parts of the day – approximately 08.00 to 14.30 during the survey period – background noise levels are significantly higher due to noise from plant at the laundry.

#### Context

- 6.5. As BS 4142:2014 advises, the impact must be considered within the context of the site and the surrounding acoustic environment. The following must, therefore, also be taken into consideration when determining the potential impact that may be experienced:
  - The assessment is undertaken at the nearest residential windows. The impact on all other nearby residential windows will be lower due to screening and distance attenuation.
  - The assessment compares the noise from the proposed new plant with the lowest background sound levels during the proposed operating periods, and therefore offers a very robust assessment of potential noise impact.



• There are currently a number of plant items serving other premises in the area, including plant operating at a much higher noise level than the proposed plant (including the laundrette ventilation plant, which begins operating at 08.00). Therefore, noise emitted from the new plant will not be out of keeping with the existing noise climate.

#### Uncertainties

- 6.6. Where possible, uncertainty in this assessment has been minimised by taking the following steps:
  - The measurement of the background sound levels was undertaken at a location within close proximity to the nearest noise sensitive receptors, with comparable distance and screening to local noise sources.
  - The meter and calibrator used have a traceable laboratory calibration and were field calibrated before and after the measurements.
  - Uncertainty in the calculated impact has been reduced by the use of a well-established calculation method.
- 6.7. All reasonable steps have been taken to robustly assess noise from the proposed plant.

#### Assessment against LOEAL and SOEAL criteria

- 6.8. As noted above, SOEAL is intended to protect people against effects on health and quality of life. Since both the specific and rating noise levels of the proposed plant at the nearest residential window are at or below the both the lowest and the representative background it is clear that no such effects could be attributed to the new plant.
- 6.9. The LOAEL refers to changes in behaviour. The new plant is not expected to cause such changes in behaviour, since:
  - Plant noise is already a feature of the environment
  - The new plant will not operate early in the morning or late into the evening or at night, and not at times when existing plant in the area does not currently operate
  - Noise from the new plant at the nearest residential window is at or below the lowest existing background sound level
  - The background sound level for long periods of the day is significantly higher than noise from the new plant



### 7.0 Summary

- 7.1. Noise Solutions Ltd (NSL) has been commissioned by SweetTree Home Care Services to undertake a noise impact assessment of proposed new external air conditioning units serving their offices at Coleridge Gardens, London.
- 7.2. An environmental noise survey has been undertaken to establish the existing prevailing noise levels at a location representative of the noise climate outside the nearest noise sensitive receptors to the plant area.
- 7.3. The calculated cumulative noise level of the new plant, at the nearest noise-sensitive residential premises, falls within the London Borough of Camden's "amber" category, and will result in, at worst, a "low impact, depending on the context" using the method in BS 4142:2014.
- 7.4. Further examination of the context indicates that in fact the impact will be negligible, due to the proposed operating hours and the large number of other plant items in the area, and in particular the relatively high noise levels produced by the laundrette ventilation plant, this should be acceptable.



# Appendix A Acoustic terminology

Parameter	Description
Ambient Noise Level	The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near (L <sub>Aeq,T</sub> ).
Decibel (dB)	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log10 (s1/s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20\mu$ Pa. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions.
dB(A), L <sub>Ax</sub>	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
Fast Time Weighting	Setting on sound level meter, denoted by a subscript F, that determines the speed at which the instrument responds to changes in the amplitude of any measured signal. The fast time weighting can lead to higher values than the slow time weighting when rapidly changing signals are measured. The average time constant for the fast response setting is 0.125 (1/8) seconds.
Free-field	Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres
Façade	Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade.
L <sub>Aeq,T</sub>	A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded.
L <sub>max,T</sub>	A noise level index defined as the maximum noise level recorded during a noise event with a period T. L <sub>max</sub> is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L <sub>eq</sub> noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
L <sub>10,T</sub>	A noise level index. The noise level exceeded for 10% of the time over the period T. L <sub>10</sub> can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. L <sub>A10,18h</sub> is the A –weighted arithmetic average of the 18 hourly L <sub>A10,1h</sub> values from 06:00-24:00.
L <sub>90,T</sub>	A noise level index. The noise level that is exceeded for 90% of the measurement time interval, T. It gives an indication of the lower levels of fluctuating noise. It is often used to describe the background noise level and can be considered to be the "average minimum" noise level and is a term used to describe the level to which non-specific noise falls during quiet spells, when there is lull in passing traffic for example.



### Appendix B Photographs of site showing areas of interest

Views from proposed plant location (roof light indicated is common reference point)



Nearest residential windows (R1)



### Appendix C Environmental sound survey

#### **Details of environmental sound surveys**

- C.1 Measurements of the existing background sound levels were undertaken from 11.45 hours on Monday 14<sup>th</sup> May to 11.15 hours on Tuesday 15<sup>th</sup> May 2018.
- C.2 The sound level meter was programmed to record the A-weighted L<sub>eq</sub>, L<sub>90</sub>, L<sub>10</sub> and L<sub>max</sub> noise indices for consecutive fifteen-minute sample periods for the duration of the survey.

#### **Measurement position**

C.3 The representative measurement position was located on the lower roof of the SweetTree premises, at the rear (location indicated on the site plan in **Appendix B**). In accordance with BS 7445-2:21991 '*Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use'*, the measurements were undertaken under free-field conditions.

#### Equipment

C.4 Details of the equipment used during the survey are provided in the table below. The sound level meter was calibrated before and after the survey; no significant change (+/-0.2 dB) in the calibration level was noted.

Description	Model / serial no.	Calibration date	Calibration certificate no.	
Class 1 Sound level meter	Rion NL-31 / 00593605			
Condenser microphone	Rion UC-53A / 316131	09/03/2018	TCRT18/1206	
Preamplifier	Rion NH-21 / 30365			
Calibrator	Rion NC-74 /35094453	09/03/2018	TCRT18/1141	

C.5 Weather conditions were determined both at the start and on completion of the survey. It is considered that the meteorological conditions were appropriate for environmental noise measurements. The table below presents the weather conditions recorded on site at the beginning and end of the survey.



Weather Conditions						
Measurement Location Time/Date		Description	Beginning of Survey	End of Survey		
As indicated on Appendix B	11.45 14/05/2018 – 11.15 15/05/2018	Temperature (°C)	20	22		
Cloud	Cover	Precipitation:	No	No		
Symbol Scale in oktas (eighths) 0 Sky completely clear 1 2 3 4 Sky half cloudy		Cloud cover (oktas – see guide)	1	0		
		Presence of fog/snow/ice	No	No		
		Presence of damp roads/wet ground	Some damp patches on roof	No		
5		Wind Speed (m/s)	8	6		
6		Wind Direction	NNE	NNE		
7   8   8   9)   5ky obs	npletely cloudy structed from view	Conditions that may cause temperature inversion (i.e. calm nights with no cloud)	No	No		

#### Results

C.6 The results of the survey are considered to be representative of the background sound pressure levels at the façades of the most affected noise sensitive receptors to the plant area during the quietest times at which the plant will operate. The noise climate at the measurement position was dominated by ventilation and other plant serving neighbouring premises. A summary of the background sound levels measured is tabulated below. The results of the survey are presented in a time history graph overleaf.



Measurement Period (start)	L <sub>A90,15min</sub> dB	Comments (see notes)
11:45	61.9	А
12:00	61.5	А
12:15	61.5	А
12:30	60.9	А
12:45	61.3	А
13:00	61.1	А
13:15	61.3	А
13:30	61.2	А
13:45	60.7	А
14:00	60.4	А
14:15	60.5	А
14:30	48.4	А
14:45	48.7	А
15:00	48.1	А
15:15	49.0	А
15:30	47.9	А
15:45	48.5	А
16:00	49.3	А
16:15	48.3	А
16:30	49.0	А
16:45	46.8	А
17:00	46.5	В
17:15	45.8	В
17:30	46.3	В
17:45	46.1	В
18:00	45.4	В
18:15	46.2	В
18:30	46.1	В
18:45	46.2	В
19:00	47.0	В
19:15	45.2	В
19:30	46.6	В
19:45	44.7	В
20:00	44.3	
20:15	44.1	

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Measurement Period (start)	L <sub>A90,15min</sub> dB	Comments (see notes)
20:30	43.3	
20:45	43.6	
21:00	43.1	
21:15	43.6	
21:30	43.1	
21:45	42.9	
22:00	43.4	
22:15	43.2	
22:30	42.6	
22:45	41.7	
23:00	40.7	
23:15	40.7	
23:30	40.4	
23:45	39.7	
00:00	39.4	
00:15	39.1	
00:30	38.8	
00:45	38.1	
01:00	38.1	
01:15	38.1	
01:30	38.2	
01:45	38.1	
02:00	38.4	
02:15	37.9	
02:30	38.0	
02:45	38.0	
03:00	37.9	
03:15	38.1	
03:30	38.1	
03:45	38.3	
04:00	39.0	
04:15	39.8	
04:30	39.3	
04:45	39.6	
05:00	39.3	

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Measurement Period (start)	L <sub>A90,15min</sub> dB	Comments (see notes)
05:15	39.8	
05:30	40.2	
05:45	40.7	
06:00	42.4	
06:15	43.9	
06:30	51.7	
06:45	52.2	
07:00	52.3	
07:15	52.7	
07:30	52.4	
07:45	52.2	
08:00	52.5	В
08:15	61.0	В
08:30	62.2	В
08:45	62.1	В
09:00	62.3	А
09:15	62.2	А
09:30	62.3	А
09:45	62.4	А
10:00	62.1	А
10:15	62.3	А
10:30	62.2	А
10:45	61.9	А
11:00	61.2	А

#### Notes:

A – All condenser units to operate

*B* – Finance office condenser unit off, all others to operate







# Appendix D Manufacturer's plant noise levels

	Manufacturer / Model	Quantity	Operating Period	Sound Power Level, dB(A)
Main Office AC units	Fujitsu AOYG36LBTA	3	08.00 – 20.00 hours	54 dBA at 1m
Finance Office AC unit	Fujitsu AOYG24LFCC	1	09.00 - 17.00 hours	56 dBA at 1m



# Appendix E Plant noise calculations

#### **Receptor R1 – Flats overlooking plant area**

Plant	Source sound pressure level dBA	Distance (m)	Correction (dB)	Surface Directivity (dB)	Screening Correction (dB)	BS 4142:2014 Feature correction (dB)	Rating level at receptor
Main Office AC unit No. 1	54 at 1m	7	-17	3	0	0	40
Main Office AC unit No. 2	54 at 1m	7	-17	3	0	0	40
Main Office AC unit No. 3	54 at 1m	7	-17	3	0	0	40
Finance Office AC unit	56 at 1m	7	-17	3	0	0	42
Cumulative rating noise level (09.00 – 17.00)					47		
Cumulative rating noise level (08.00 – 20.00)				45			