24Acoustics
Pepper Mill Barn
Old Salisbury Lane
Romsey
SO51 0GD

T: 01794 515999
E: info@24acoustics.co.uk

10 PARKWAY, CAMDEN

PLANT NOISE IMPACT ASSESSMENT

Technical Report: R6708-1 Rev 0

Date: 16th February 2017

For: London and Regional
8th Floor, South Block
55 Baker Street
London
W1U 8EW

24 Acoustics Document Control Sheet

Project Title: 10 Parkway, Camden, Plant Noise Impact Assessment

Report Ref: R6708-1 Rev 0

Date: 16th February 2017

	Name	Position	Signature	Date
Prepared by	Kiel Edwards BSc AMIOA	Technician		
Approved by	Steve Gosling BEng (Hons) MIOA	Principal Consultant		
For and on behalf of 24 Acoustics Ltd				

Document Status and Approval Schedule

Revision	Description	Prepared By	Approved By
0	Approved for Issue	Kiel Edwards	Steve Gosling

DISCLAIMER

This report was completed by 24 Acoustics Ltd on the basis of a defined programme of work and terms and conditions agreed with the Client. The report has been prepared with all reasonable skill, care and diligence within the terms of the Contract with the Client and taking into account the project objectives, the agreed scope of works, prevailing site conditions and the degree of manpower and resources allocated to the project.

24 Acoustics Ltd accepts no responsibility whatsoever, following the issue of the report, for any matters arising outside the agreed scope of the works.

This report is issued in confidence to the Client and 24 Acoustics Ltd has no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

Unless specifically assigned or transferred within the terms of the agreement, 24 Acoustics Ltd retains all copyright and other intellectual property rights, on and over the report and its contents.

CONTENTS **Page**

1.0 INTRODUCTION

1.1 24 Acoustics Ltd has been retained to undertake an assessment of the potential noise impact from proposed plant at 10 Parkway, Camden. Eleven total plant units are proposed to replace existing roof mounted plant.

1.2 The assessment has been undertaken following ambient noise surveys at the site undertaken between 10th and 14th November 2016.

1.3 All sound pressure levels quoted in this report are in dB relative to 20 µPa. All sound power levels are quoted in dB relative to 10^{-12} Watts. A glossary of the acoustic terminology used in this report is provided in Appendix A.

2.0 SITE DESCRIPTION

2.1 The property is located in central Camden in London. The front of the building bounds the A4201 which is a single carriageway, retail and office buildings overlook the property. The rear of the property faces service areas for adjoining buildings.

2.2 Planning consent is sought from Camden Council to replace existing plant on the rooftop of 10 Parkway. Noise from the proposed new plant has the potential to impact nearby residential properties. A noise impact assessment has therefore been undertaken to determine the level of impact from the proposed new plant.

2.3 It is understood that the nearest residential property is Flat 4, 16 Parkway, located south west of the proposed new plant at a distance of approximately 23m and screened from the proposed new plant. This property is shown as Receptor 1 in Figure 1.

2.4 Plant associated with neighbouring retail units and road traffic in the nearby area are the dominant sources of background noise at the property. In addition, ambient noise from the immediate area contributes to the surrounding noise environment.

2.5 Figure 1 shows the existing site layout and proposed plant location.

3.0 STANDARDS AND GUIDANCE

NPPF

3.1 The National Planning Policy Framework (NPPF) [Reference 1] was published by the Department for Communities and Local Government in 2012. For noise, the NPPF policy states that planning policies and decisions should aim to:

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions, while recognising that many developments will create some noise.

3.2 The NPPF refers to the Noise Policy Statement for England (NPSE) [Reference 2] which is intended to apply to all forms of noise, including environmental noise, neighbour noise and neighbourhood noise. The NPSE sets out the Government's long-term vision to 'promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development' which is supported by the following aims.

- Avoid significant adverse impacts on health and quality of life;
- Mitigate and minimise adverse impacts on health and quality of life.

3.3 The NPSE defines the concept of a 'significant observed adverse effect level' (SOAEL) as 'the level above which significant adverse effects on health and quality of life occur'. The following guidance is provided within the NPSE:

> *"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."*

3.4 In 2014 the Planning Practice Guidance (PPG) was finalised [Reference 3]. This is written to support the NPPF with more specific planning guidance. The PPG reflects the NPSE and states that noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. It also states that opportunities should be taken, where practicable, to achieve improvements to the acoustic environment. The PPG states that noise can over-ride other planning concerns but should not be considered in isolation from the other economic, social and environmental dimensions of the proposed development.

3.5 The PPG expands upon the concept of SOAEL (together with Lowest Observable Adverse Effect Level, LOAEL and No Observed Effect Level, NOEL) as introduced in the NPSE and provides a table of noise exposure hierarchy for use in noise impact assessments in the planning system. Table 1 is reproduced from the NPPG and summarises the noise exposure hierarchy, based on the likely average response.

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life	No Observed Adverse Effect	No specific measures required
Lowest Observable Adverse Effect Level (LOAEL)			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/ or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Noticeable and disruptive	The noise causes a material change in behaviour and/ or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extension and regular changes in behaviour and/ or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/ awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non auditory	Unacceptable Adverse Effect	Prevent

Table 1: PPG Noise Exposure Hierarch

3.6 In general terms, it is considered that a noise impact with an effects level which is lower than SOAEL is acceptable (providing the effect is mitigated to a minimum). There is currently, however, a major discontinuity between the above guidance and objective technical criteria for use in planning noise impact assessments. For this site, it is considered that the appropriate (technical and objective) standard for use in assessing the noise impact is those of British Standard 4142 [Reference 4]. These are described below.

British Standard 4142: 2014

3.7 This standard provides a method for rating the effects of industrial and commercial sound on residential areas. The standard advocates a comparison between the typical measured L_{A90} background noise (sound) level and L_{Aeq} (sound) noise level from the source being considered. The standard states that a difference between the rating level and the background level of around +10 dBA is an indication of a significant adverse impact,

depending on the context and a difference of around +5 dBA is likely to be an indication of an adverse impact again depending on the context. Where the rating level does not exceed the background noise (sound) level, this is an indication of the specific sound source having a low impact (depending upon the context).

3.8 The Local Planning Authority: Camden council states;

> *"The Council will only grant permission for plant or machinery if it can be operated without causing harm to amenity and does not exceed our noise thresholds."* (Table 2).

Noise Description and Location of Measurement	Period	Time	Noise Level
Noise at 1 metre external to a sensitive façade	Day, Evening and Night	0000 - 2400	5 dB(A) < LA90
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 metre external to a sensitive façade	Day, Evening and Night	0000 - 2400	10 dB(A) < LA90
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade	Day, Evening and Night	0000 - 2400	10 dB(A) < LA90
Noise at 1 metre external to sensitive façade where LA90 > 60 dB	Day, Evening and Night	0000 - 2400	55 dB LAeq

Table 2: Camden Councils Noise Criteria.

3.9 With respect to the proposed site is it considered that the plant rating noise level should be at least 5 dB lower than the relevant background noise level at the nearest residential property.

4.0 ASSESSMENT METHODOLOGY

4.1 The following assessment methodology has been used:

i. A background noise survey has been undertaken to determine existing levels of background noise at the nearest residential property;
ii. Calculations of the noise level from proposed plant at the nearest residential properties from manufacturers data;
iii. An assessment of the likely noise impact has been undertaken in accordance with Camden Councils guidance. A target difference of -5 dB or lower between the rating noise level and background noise level.

5.0 ENVIRONMENTAL NOISE MEASUREMENTS

5.1 Background noise measurements were undertaken to determine the existing noise level at 10 Parkway, Camden. Noise monitoring equipment was located at roof level to the rear of the property at a distance of approximately 24m from the nearest residential properties. This location is considered representative of prevailing noise levels in the area and at the nearest residential windows to the proposed plant. The survey location is shown in Figure 1. Measurements were undertaken in samples of 5 minutes in terms of the overall free-field A-weighted L_{eq}, L_{90} and $L_{max,f}$ noise levels. Noise measurements were undertaken between 10th and 14th November 2016.

5.2 The survey was undertaken with the following instrumentation:

- Rion NL32 Class 1 accuracy sound level meter;
- Bruel and Kjaer Type 4231 Class 1 accuracy acoustic calibrator.

5.3 The instrumentation was calibrated before and after the surveys in accordance with the manufacturer's instructions. No significant drift in calibration was recorded. All instruments were fitted with environmental weather shields during the surveys.

5.4 Weather conditions during the survey were generally fine and dry. Wind speeds were lower than 5 m/s during the measurements.

5.5 The results of the background noise survey are shown graphically in Appendix B and summarised in Table 3 (analysed into hourly daytime periods and 15 minute night time periods in accordance with BS 4142). BS 4142 requires a representative background noise level to be used for the assessment period under consideration. In this instance, it is considered that the typical noise level is representative (24 Acoustics determines the typical noise level to be the average minus one standard deviation). This method is considered suitable – the data is summarised in Table 3.

Daytime Level, dB (07:00 - 23:00) Typical $L_{A90,\ 1\ hour}$	**Night Time Level, dB (23:00 - 07:00) Typical $L_{A90,\ 15\ min}$**
52	49

Table 3: Summary of Background Noise Levels.

6.0 CALCULATIONS AND NOISE IMPACT ASSESSMENT

6.1 The proposed plant will comprise the following units located at roof level;

- Daikin REYQ 8T
- Daikin REYQ 12T (x 2)
- Daikin REYQ 14T
- Daikin REYQ 16T (x 3)
- Daikin ERQ 250 AW1 (x 2)
- Nuaire ATV5 System 1
- ECE Air handling unit BVU-50cc 5

6.2 The following assessment has assumed a worst case operating time for the proposed plant, being continuous operation for both daytime and night time periods.

6.3 Screening from the proposed plant to Receptor 1 will be provided by the neighbouring wall and existing rooftop barrier as well as existing plant associated with retail units below.

6.4 The manufacturer's stated plant noise levels are detailed in Table 4.

Model	Sound Power Level (dB) per Octave Band Frequency, Hz								dBA
	63	125	250	500	1k	2k	4k	8k	
Daikin REYQ 8T	77	77	78	77	74	67	67	59	79
Daikin REYQ 12T	82	82	81	81	76	71	66	62	82
Daikin REYQ 14T	84	84	83	80	76	70	67	61	82
Daikin REYQ 16T	88	88	87	86	82	74	70	66	87
Daikin ERQ 250 AW1	84	84	80	77	73	66	59	53	79
ECE BVU-50cc 5 Supply	76	74	79	81	82	78	75	72	86
ECE BVU-50cc 5 Extract	67	69	72	74	74	73	70	70	79

Table 4: Plant Sound Power Levels.

6.5 Calculations have been undertaken to determine the noise level at the nearest residential property from the proposed plant. Calculations have been completed using single octave data as shown in full in Appendix C.

6.6 Calculations indicate that, with the proposed plant installed the noise level at the closest residential property will be in the order of 43 dB L_{Aeq} during operation. The noise level at other properties will be lower.

Noise Impact Assessment

6.7 An assessment of noise levels from the proposed plant has been carried out in accordance with the requirements of BS 4142 at the nearest residential property. The assessment results are detailed in Table 5.

	Daytime (07:00 - 23:00 hours)	Night-time (23:00 - 07:00 hours)
Typical Background Noise Level	52 dB $L_{A90, 1\ hour}$	49 dB $L_{A90, 15\ min}$
Specific Source Noise Level	43 dB $L_{Aeq, 1\ hour}$	43 dB $L_{Aeq, 15\ min}$
Character Correction	0 dB	0 dB
Rating Noise Level	43 dB	43 dB
BS 4142 Assessment Level	-9 dB	-6 dB

Table 5: BS 4142 Noise Assessment, Nearest Residential Property.

6.8 The assessment shows that the requirements of Camden Council (ie, at least 5 dB below background) will be achieved.

7.0 CONCLUSIONS

7.1 24 Acoustics Ltd has been instructed by London and Regional to undertake an assessment of the noise impact from proposed plant associated with 10 Parkway, Camden.

7.2 An assessment has been undertaken following background noise measurements obtained between 10th and 14th November 2016.

7.3 The assessment shows that noise arising from the plant at the nearest residential property will be within the local authority's requirements and therefore acceptable.

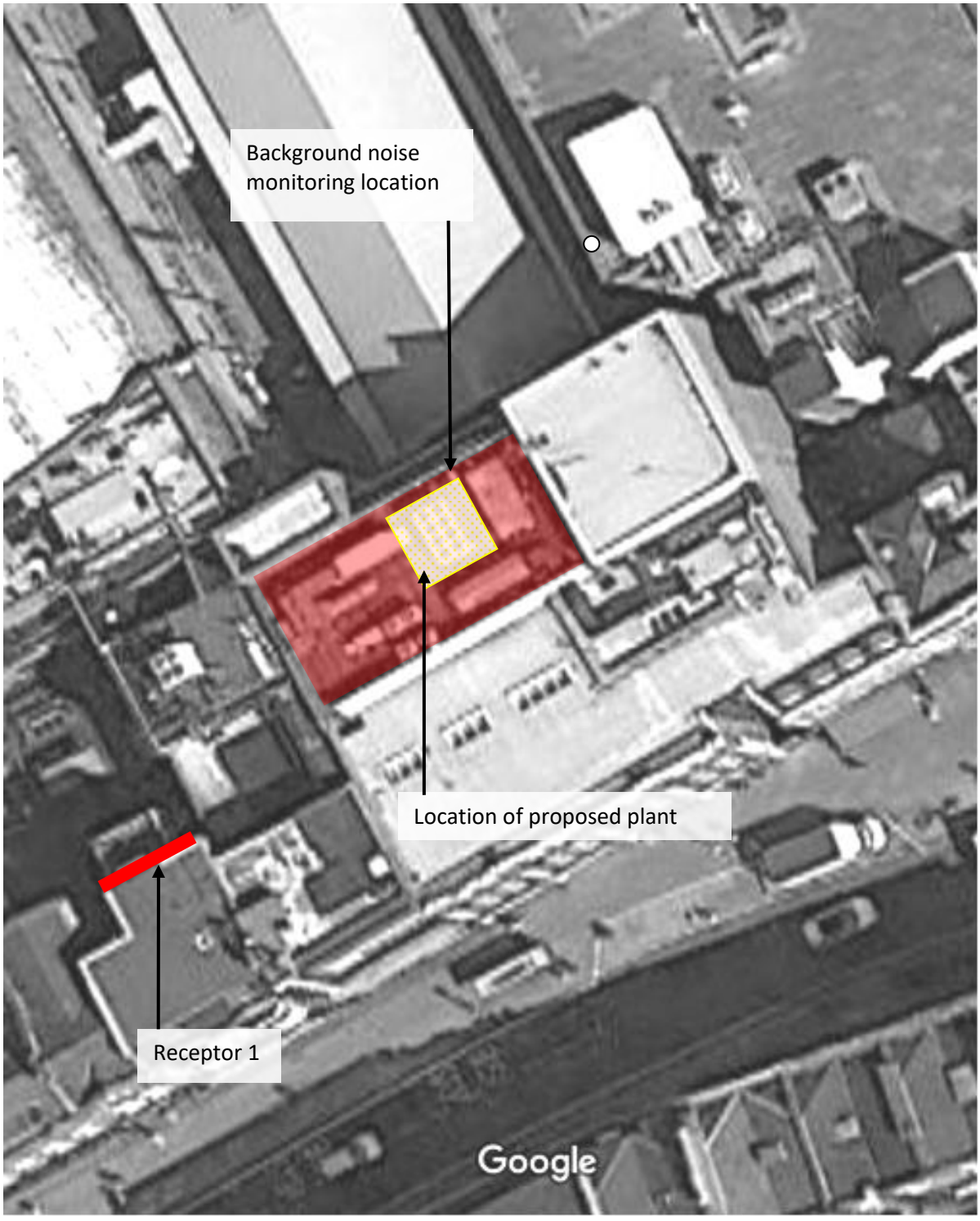
REFERENCES

1. National Planning Policy Framework, Department for Communities and Local Government, 2012.

2. Noise Policy Statement for England, Defra, 2010.

3. Planning Practice Guidance, Department of Communities and Local Government, March 2014.

4. British Standards Institution. British Standard 4142: 'Method for Rating and Assessing Industrial and Commercial Sound', 2014.



Project: 10 Parkway, Camden	**Description:** Site Layout Plan	
DWG No: Figure 1	**Scale:** N.T.S.	**Rev:** A
Date: February 2017	**Drawn By:** KE	**Job No:** 6708-1

24Acoustics
www.24acoustics.co.uk

APPENDIX A – ACOUSTIC TERMINOLOGY

Noise is defined as unwanted sound. The range of audible sound is from 0 to 140 dB. The frequency response of the ear is usually taken to be around 18 Hz (number of oscillations per second) to 18000 Hz. The ear does not respond equally to different frequencies at the same level. It is more sensitive in the mid-frequency range than the lower and higher frequencies and because of this, the low and high frequency components of a sound are reduced in importance by applying a weighting (filtering) circuit to the noise measuring instrument. The weighting which is most widely used and which correlates best with subjective response to noise is the dBA weighting. This is an internationally accepted standard for noise measurements.

For variable sources, such as traffic, a difference of 3 dBA is just distinguishable. In addition, a doubling of traffic flow will increase the overall noise by 3 dBA. The 'loudness' of a noise is a purely subjective parameter, but it is generally accepted that an increase/ decrease of 10 dBA corresponds to a doubling/ halving in perceived loudness.

External noise levels are rarely steady, but rise and fall according to activities within an area. In attempt to produce a figure that relates this variable noise level to subjective response, a number of noise indices have been developed. These include:

i) The L_{Amax} noise level

This is the maximum noise level recorded over the measurement period.

ii) The L_{Aeq} noise level

This is "equivalent continuous A-weighted sound pressure level, in decibels" and is defined in British Standard BS 7445 as the "value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time internal, T, has the same mean square sound pressure as a sound under consideration whose level varies with time".

It is a unit commonly used to describe construction noise and noise from industrial premises and is the most suitable unit for the description of other forms of environmental noise. In more straightforward terms, it is a measure of energy within the varying noise.

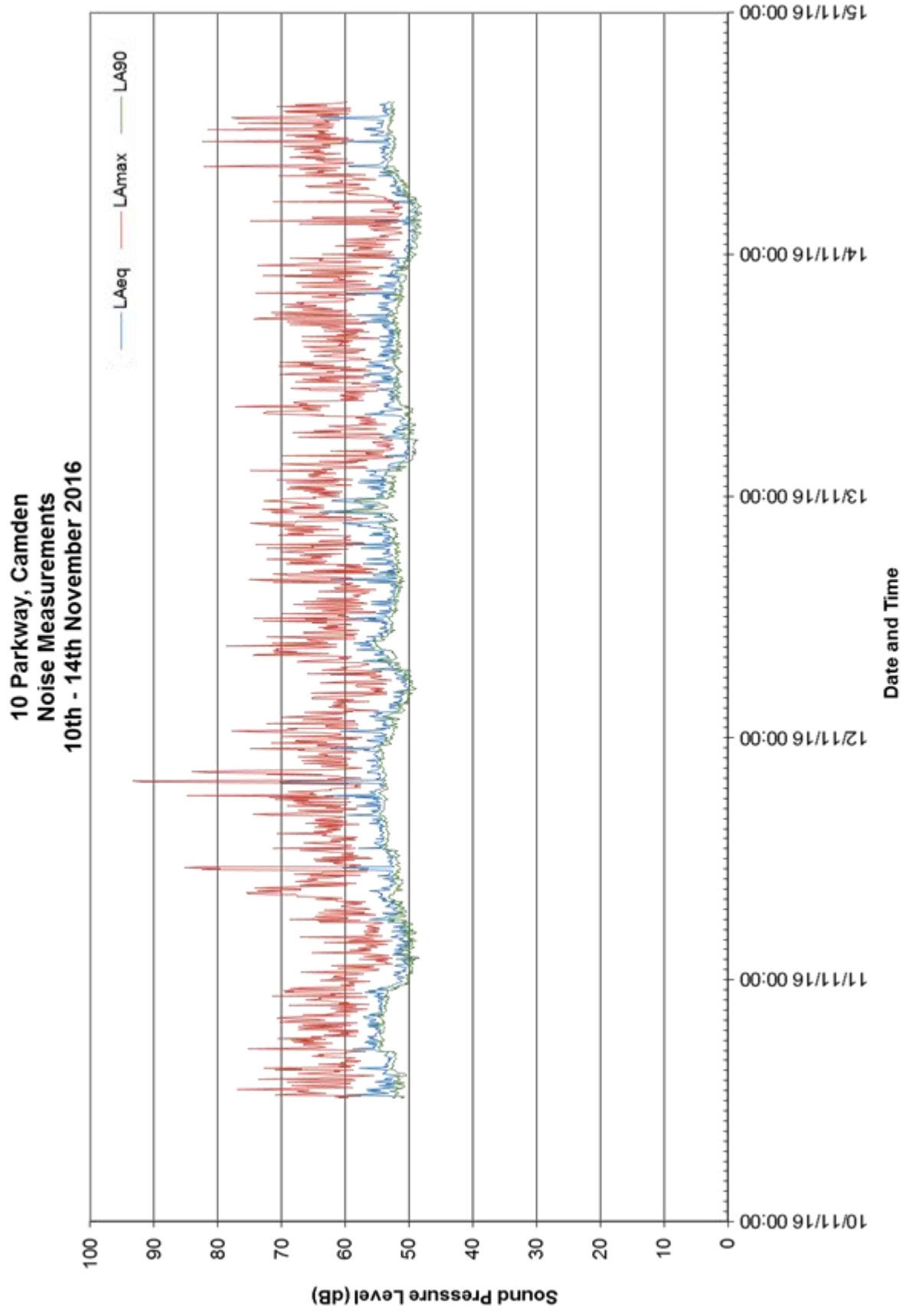
iii) The L_{A10} noise level

This is the noise level that is exceeded for 10% of the measurement period and gives an indication of the noisier levels. It is a unit that has been used over many years for the measurement and assessment of road traffic noise.

iv) The L_{A90} noise level

This is the noise level that is exceeded for 90% of the measurement period and gives an indication of the noise level during the quieter periods. It is often referred to as the background noise level and is used in the assessment of disturbance from industrial noise.

APPENDIX B – AMBIENT NOISE SURVEY RESULTS



APPENDIX C – CALCULATED NOISE LEVELS

Unit	63	125	250	500	1k	2k	4k	8k	dB(A)	Comments
Unit Lw										
1) Daikin REYQ 12T	82	82	81	81	76	71	66	62	**82**	Max operation
2) Daikin REYQ 12T	82	82	81	81	76	71	66	62	**82**	Max operation
3) Daikin REYQ 16T	88	88	87	86	82	74	70	66	**87**	Max operation
4) Daikin REYQ 16T	88	88	87	86	82	74	70	66	**87**	Max operation
5) Daikin REYQ 16T	88	88	87	86	82	74	70	66	**87**	Max operation
6) Daikin REYQ 14T	84	84	83	80	76	70	67	61	**82**	Max operation
7) Daikin REYQ 8T	77	77	78	77	74	67	67	59	**79**	Max operation
8) Daikin ERQ 250 AHU	84	84	80	77	73	66	59	53	**79**	Max operation
9) Daikin ERQ 250 AHU	84	84	80	77	73	66	59	53	**79**	Max operation
10) Nuaire ATV5 System 1	71	66	60	53	50	49	50	44	**59**	Max operation, including attenuator
11) Air Handling Unit BVU-50cc 5 Supply	76	74	79	81	82	78	75	72	**86**	Operation speed 2137
12) Air Handling Unit BVU-50cc 5 Extract	67	69	72	74	74	73	70	70	**79**	Operation speed 1595
Distance Loss										
1) Daikin REYQ 12T	-35	-35	-35	-35	-35	-35	-35	-35		Distance to nearest window = 23m
2) Daikin REYQ 12T	-35	-35	-35	-35	-35	-35	-35	-35		Distance to nearest window = 23m
3) Daikin REYQ 16T	-35	-35	-35	-35	-35	-35	-35	-35		Distance to nearest window = 23m
4) Daikin REYQ 16T	-35	-35	-35	-35	-35	-35	-35	-35		Distance to nearest window = 23m
5) Daikin REYQ 16T	-35	-35	-35	-35	-35	-35	-35	-35		Distance to nearest window = 23m
6) Daikin REYQ 14T	-35	-35	-35	-35	-35	-35	-35	-35		Distance to nearest window = 23m
7) Daikin REYQ 8T	-35	-35	-35	-35	-35	-35	-35	-35		Distance to nearest window = 23m
8) Daikin ERQ 250 AHU	-35	-35	-35	-35	-35	-35	-35	-35		Distance to nearest window = 23m
9) Daikin ERQ 250 AHU	-35	-35	-35	-35	-35	-35	-35	-35		Distance to nearest window = 23m
10) Nuaire ATV5	-37	-37	-37	-37	-37	-37	-37	-37		Distance to nearest window = 29m
11) Air Handling Unit BVU-50cc 5 Supply	-34	-34	-34	-34	-34	-34	-34	-34		Distance to nearest window = 21m
12) Air Handling Unit BVU-50cc 5 Extract	-34	-34	-34	-34	-34	-34	-34	-34		Distance to nearest window = 21m
Screening										
1) Daikin REYQ 12T	-7	-7	-8	-9	-10	-12	-22	-22		Enclosure arround rooftop plant area
2) Daikin REYQ 12T	-7	-7	-8	-9	-10	-12	-22	-22		Enclosure arround rooftop plant area
3) Daikin REYQ 16T	-7	-7	-8	-9	-10	-12	-22	-22		Enclosure arround rooftop plant area
4) Daikin REYQ 16T	-7	-7	-8	-9	-10	-12	-22	-22		Enclosure arround rooftop plant area
5) Daikin REYQ 16T	-7	-7	-8	-9	-10	-12	-22	-22		Enclosure arround rooftop plant area
6) Daikin REYQ 14T	-7	-7	-8	-9	-10	-12	-22	-22		Enclosure arround rooftop plant area
7) Daikin REYQ 8T	-7	-7	-8	-9	-10	-12	-22	-22		Enclosure arround rooftop plant area
8) Daikin ERQ 250 AHU	-7	-7	-8	-9	-10	-12	-22	-22		Enclosure arround rooftop plant area
9) Daikin ERQ 250 AHU	-7	-7	-8	-9	-10	-12	-22	-22		Enclosure arround rooftop plant area
10) Nuaire ATV5	-7	-7	-8	-9	-10	-12	-22	-22		Enclosure arround rooftop plant area
11) Air Handling Unit BVU-50cc 5 Supply	-7	-7	-8	-9	-10	-12	-22	-22		Enclosure arround rooftop plant area
12) Air Handling Unit BVU-50cc 5 Extract	-7	-7	-8	-9	-10	-12	-22	-22		Enclosure arround rooftop plant area
Other losses										
1) Daikin REYQ 12T	0	0	0	0	0	0	0	0		None
2) Daikin REYQ 12T	0	0	0	0	0	0	0	0		None
3) Daikin REYQ 16T	0	0	0	0	0	0	0	0		None
4) Daikin REYQ 16T	0	0	0	0	0	0	0	0		None
5) Daikin REYQ 16T	0	0	0	0	0	0	0	0		None
6) Daikin REYQ 14T	0	0	0	0	0	0	0	0		None
7) Daikin REYQ 8T	0	0	0	0	0	0	0	0		None
8) Daikin ERQ 250 AHU	0	0	0	0	0	0	0	0		None
9) Daikin ERQ 250 AHU	0	0	0	0	0	0	0	0		None
10) Nuaire ATV5	0	0	0	0	0	0	0	0		None
11) Air Handling Unit BVU-50cc 5 Supply	-15	-20	-24	-31	-36	-37	-35	-29		Double skin metal panel
12) Air Handling Unit BVU-50cc 5 Extract	-15	-20	-24	-31	-36	-37	-35	-29		Double skin metal panel
Directivity										
1) Daikin REYQ 12T	-2.0	-2.0	-4.0	-6.0	-6.0	-8.0	-8.0	-8.0		Units facing away from nearest residential property
2) Daikin REYQ 12T	-2.0	-2.0	-4.0	-6.0	-6.0	-8.0	-8.0	-8.0		Units facing away from nearest residential property
3) Daikin REYQ 16T	-2.0	-2.0	-4.0	-6.0	-6.0	-8.0	-8.0	-8.0		Units facing away from nearest residential property
4) Daikin REYQ 16T	-2.0	-2.0	-4.0	-6.0	-6.0	-8.0	-8.0	-8.0		Units facing away from nearest residential property
5) Daikin REYQ 16T	-2.0	-2.0	-4.0	-6.0	-6.0	-8.0	-8.0	-8.0		Units facing away from nearest residential property
6) Daikin REYQ 14T	-2.0	-2.0	-4.0	-6.0	-6.0	-8.0	-8.0	-8.0		Units facing away from nearest residential property
7) Daikin REYQ 8T	-2.0	-2.0	-4.0	-6.0	-6.0	-8.0	-8.0	-8.0		Units facing away from nearest residential property
8) Daikin ERQ 250 AHU	-2.0	-2.0	-4.0	-6.0	-6.0	-8.0	-8.0	-8.0		Units facing away from nearest residential property
9) Daikin ERQ 250 AHU	-2.0	-2.0	-4.0	-6.0	-6.0	-8.0	-8.0	-8.0		Units facing away from nearest residential property
10) Nuaire ATV5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		None
11) Air Handling Unit BVU-50cc 5 Supply	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		None
12) Air Handling Unit BVU-50cc 5 Extract	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		None
Levels at nearest sensitive window										
1) Daikin REYQ 12T	38	38	34	31	25	16	1	-3	**32**	Noise level from condenser unit
2) Daikin REYQ 12T	38	38	34	31	25	16	1	-3	**32**	Noise level from condenser unit
3) Daikin REYQ 16T	44	44	40	36	31	19	5	1	**37**	Noise level from condenser unit
4) Daikin REYQ 16T	44	44	40	36	31	19	5	1	**37**	Noise level from condenser unit
5) Daikin REYQ 16T	44	44	40	36	31	19	5	1	**37**	Noise level from condenser unit
6) Daikin REYQ 14T	40	40	36	30	25	15	2	-4	**32**	Noise level from condenser unit
7) Daikin REYQ 8T	33	33	31	27	23	12	2	-6	**28**	Noise level from condenser unit
8) Daikin ERQ 250 AHU	40	40	33	27	22	11	-6	-12	**30**	Noise level from condenser unit
9) Daikin ERQ 250 AHU	40	40	33	27	22	11	-6	-12	**30**	Noise level from condenser unit
10) Nuaire ATV5	27	22	15	7	3	0	-9	-15	**12**	Noise level from condenser unit
11) Air Handling Unit BVU-50cc 5 Supply	20	13	13	7	2	-5	-16	-13	**9**	Noise level from condenser unit
12) Air Handling Unit BVU-50cc 5 Extract	11	8	6	0	-6	-10	-21	-15	**2**	Noise level from condenser unit
Total									**43**	level from plant at nearest residential window

Table C1: Calculated Noise Levels, Nearest Residential Window (Receptor 1).