



REPORT REFERENCE:

IMP5185-1

ENVIRONMENTAL NOISE IMPACT ASSESSMENT

British Standard 8233: 2014

British Standard 4142: 2014

CLIENT:

The Faculty

SITE:

The Faculty, 23 – 27 London Road, Reading, RG1 5BJ

SURVEY DATES:

14th – 17th September 2017

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1 EXECUTIVE SUMMARY

1.1 Instruction

Impact Acoustics Ltd has been instructed by 'The Faculty' to carry out the relevant noise assessments and calculations at The Faculty, 23 – 27 London Road, Reading, RG1 5BJ. It is proposed that the existing rear ground floor reception area is converted to form a new flat.

1.2 Scope of Report

The measurements will be undertaken in accordance with ISO 1996 – Part 2: 2007 to determine the existing background noise levels and British Standard 8233: 2014 will be used to determine the impact of existing traffic and other surrounding noise on the internal noise environment within the proposed residential dwellings. This report aims to establish the following:

- Existing background noise levels within the area;
- Assess the potential internal noise levels on the proposed rooms;
- Provide specifications for the ventilation and window glazing with the proposed rooms.
- Review any commercial surround noise and make appropriate assessments if required.

1.3 Summary of Results

1.3.1 Background Noise Levels

A background noise survey was undertaken from 14th – 17th September 2017 at two positions on the site in order to establish the underlying background noise levels associated with the nearby public house and industrial premises. The maximum day time levels were found to be $L_{Aeq, 16 \text{ hour}}$ 60.6 dB and the maximum night time levels were found to be $L_{Aeq, 8 \text{ hours}}$ 53.7 dB at position 1. The maximum day time levels were found to be $L_{Aeq, 16 \text{ hour}}$ 56.9 dB and the maximum night time levels were found to be $L_{Aeq, 8 \text{ hours}}$ 49.8 dB at position 2. Background noise levels were also found to be $L_{A90 \text{ 1 HOUR}}$ 48.0 dB during daytime hours (0700 – 2300) and $L_{A90 \text{ 15 MINUTE}}$ 42.0 dB during night time hours (2300 – 0700) at Position 1. Background noise levels at Position 2 were found to be $L_{A90 \text{ 1 HOUR}}$ 47.0 dB during daytime hours (0700 – 2300) and, $L_{A90 \text{ 15 MINUTE}}$ 39.0 dB during night time hours (2300 – 0700).

Assessment Position	Date Start	Date Finish	Daytime LAeq	Night Time LAeq
Position 1	14/09/2017	17/09/2017	60.6	53.7
Position 2	14/09/2017	17/09/2017	56.9	49.8

Assessment Position	Date Start	Date Finish	Daytime LA90	Night Time LA90
Position 1	14/09/2017	17/09/2017	48.0	42.0
Position 2	14/09/2017	17/09/2017	47.0	39.0

1.4 Conclusions

The development should be designed with a 4mm glass / 16mm air gap / 4mm glass double glazed windows and a mechanical ventilation heat recovery unit for all rooms to ensure the internal noise levels are acceptable in terms of the assessment to British Standard 8233: 2014 and planning condition 5.

Levels have been recorded and assessments made in accordance with the relevant standards. Internal criteria's have been set and calculations made in order to determine the minimum construction details required in order to meet the desired level within the proposed residential dwellings and satisfy the local council's requirements.

2 INTRODUCTION

Impact Acoustics Ltd has been instructed by 'The Faculty' to carry out the relevant noise assessments and calculations at The Faculty, 23 – 27 London Road, Reading, RG1 5BJ. It is proposed that the existing rear ground floor reception area is converted to form a new flat.

Ambient noise levels were measured from 14th – 17th September 2017. This report by Impact Acoustics Ltd gives the results of these measurements and an assessment in accordance with government planning guidelines and relevant standards together with mitigation measures as required.

2.1 PLANNING CONDITION 5

No development shall take place until a detailed scheme, informed by an assessment of the current noise environment, for protecting the dwellings from the external noise environment of the area has been submitted to and approved, in writing, by the Local Planning Authority. The scheme itself shall be designed, specified and constructed so that the sound insulation performance of the structure and the layout of the dwellings are such that the indoor ambient noise levels do not exceed the values detailed in Table 4 of BS 8233:2014. Where opening windows will lead to an internal noise level increase of 5 dB(A) or greater above BS 8233: 2014 recommended internal levels, the scheme shall include provision of alternative mechanical ventilation with minimum performance equivalent to a mechanical heat recovery (MVHR) system with cool air bypass as an alternative means of cooling and ventilation. Noise from the system should not result in BS8233 internal levels being exceeded. Thereafter, the development shall not be carried out other than in accordance with the approved scheme which shall be completed before any part of the accommodation hereby approved is occupied, unless the Local Planning Authority otherwise agree in writing.

Reason: To protect the amenity of future occupants of the proposed development in accordance with Policy CS34 of the Reading Borough LDF Core Strategy 2008 (Altered 20150).

Therefore, this technical report will look to discharge the above condition 5 of the granted planning permission Application number 170576 with assessments and calculations.

2.2 BS 8233: 2014

With regards to external ambient noise, environmental noise levels are to be monitored at the site in accordance with British Standard 7445: 2003 'Description and measurement of environmental noise assessments and calculation made in accordance with BS 8233: 2014 Sound Insulation and Noise Reduction for Buildings Code of Practice.

BS 8233: 2014 set the following parameters as target levels that should be designed to within rooms such as Living Rooms and Bedrooms.

Indoor ambient noise levels in spaces when they are unoccupied and privacy is also important		
Objective	Typical situations	Design Range L _{Aeq,t} dB
Typical noise levels for acoustic privacy in shared spaces	Living room	35 – 40
NOTE: See Noise control in building services [28] and BS EN ISO 3382.		

Indoor ambient noise levels for dwellings			
Activity	Location	07:00 – 23:00	23:00 – 07:00
Resting	Living Room	35 dB L _{Aeq} 16 HOUR	--
Dining	Dining Room / Area	40 dB L _{Aeq} 16 HOUR	--
Sleeping (daytime resting)	Bedroom	35 dB L _{Aeq} 16 HOUR	30 dB L _{Aeq} 8 HOUR

Calculations and assessments are therefore to be carried out in order to satisfy the above requirements of BS8233: 2014.

References and evaluations are to be made to the National Planning Policy Framework 2012 (NPPF) and the Noise Policy Statement for England 2010 (NPSE). The purpose of this document is to include all aspects of environmental noise within assessments i.e. environmental noise, neighbour noise and neighbourhood noise. Noise is to be considered alongside other relevant issues relating to the site and should not be considered in isolation, according to the NPSE.

There are several key phrases within the NPSE aims and these are discussed below.

2.2.1 “Significant adverse” and “adverse”

There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

2.2.2 NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

2.2.3 LOAEL – Lowest Observed Adverse Effect Level

*This is the level above which adverse effects on health and quality of life can be detected.
Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.*

2.2.4 SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.

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.

Outdoor living areas are not being proposed and therefore, no assessment has been made to the World Health Organisation’s ‘Guidelines for Community Noise’, within this technical report.

Finally, assessments and references are to be made to the World Health Organisation Night Time Noise Guidance 2009.

2.3 BS 4142: 2014

British Standard 4142: 2014 is to be adopted for the basis of this background noise level assessment and commercial noise at this site. A BS 4142: 2014 noise assessment will be carried out in order to demonstrate the existing acoustic impact the neighbouring commercial premises currently has on the nearest affected proposed residential and make suitable recommendations in order to demonstrate that their current operations will not have a significant and demonstrable adverse impact on the nearest noise sensitive premises in accordance with the National Planning Policy Framework, once remedial works are completed. BS 4142: 2014 supersedes the 1997 version and has been developed to move more in-line with the National Planning Policy Framework 2012 (NPPF) and the Noise Policy Statement for England 2010 (NPSE).

3 SITE LOCATION

Proposed Development

The proposed development is shown below.



PROPOSED RESIDENTIAL DEVELOPMENT

4 PROCEDURE

External noise levels were recorded over a typical period and analysis date extrapolated between 07:00 hrs 14th – and 07:00 hrs on 17th September 2017 at positions 1 and 2 as detailed on the attached plan sketch layout.

Position 1 was located at the rear Eastern façade of the existing unit in order to capture the noise levels associated with the nearby public house to ensure that the highest noise levels emanating from the source are considered. Position 2 was located at the rear Western façade of the existing unit in order to capture the noise levels associated with the background noise levels. Sample measurements were recorded over continuous 15 minute samples and from this data the hourly LAeq daytime values have been evaluated. Sound Pressure Levels were recorded on the following setting along with a full octave band frequency analysis measured simultaneously and between 31.5 Hz and 16.0 kHz.

Daytime 07:00 – 23:00		Night Time 23:00 – 07:00	
L _{Aeq} 1 HOUR dB	L _{A10} 1 HOUR dB	L _{Aeq} 15 MINUTES dB	L _{A10} 15 MINUTES dB
L _{AMAX} 1 HOUR dB	L _{A50} 1 HOUR dB	L _{AMAX} 15 MINUTES dB	L _{A50} 15 MINUTES dB
L _{AMIN} 1 HOUR dB	L _{A90} 1 HOUR dB	L _{AMIN} 15 MINUTES dB	L _{A90} 15 MINUTES dB

Calculations have been made in accordance with BS 8233: 2014 'Sound Insulation and Reduction of Buildings - Code of Practice'. Recommendations were made for any additional acoustics measures to conform to these standards.

From the downloaded recorded results, the daytime and night time periods were assessed and used within the above calculations as L_{Aeq} 16 HOUR dB levels for daytime and L_{Aeq} 8 HOUR dB levels for night time. These are detailed within this report. All data averaged throughout the day has been done so on a logarithmic basis to give accurate L_{Aeq} 16 Hour dB daytime and L_{Aeq} 8 Hour dB night time noise levels.

Finally, it should be noted that calculations are carried out with façade levels corrected from the recorded noise levels to the calculated façade levels.

5 APPARATUS

The equipment was calibrated using a sound pressure level of 114.0 dB at an octave band centre frequency of 1000Hz with reference to $2 \times 10^{-5} \text{ Nm}^{-2}$ before and after the tests and the equipment set to have no inaccuracy greater than 0.2dB.

All the following equipment was calibrated in accordance with the laboratory accreditation requirements of the United Kingdom Accreditation Service (UKAS) on the following dates. Calibration schedules are implemented within Sound Advice Acoustics Ltd in accordance with UKAS directive LAB 23.

5.1 118 noise meter s/n 31632 environmental testing

Description	Make	Type	Serial No.	Calibration Intervals	Last Calibrated	Next Due Calibration
Integrated Sound Level Meter	Norsonic	118	<u>31632</u>	2 YEARS	25.04.2016	25.04.2018
12.5mm Microphone (with windshield)	Norsonic	1220	<u>179711</u>	2 YEARS	25.04.2016	25.04.2018
Microphone Pre – Amplifier	Norsonic	1201	<u>30479</u>	2 YEARS	25.04.2016	25.04.2018

5.2 RION noise meter s/n 00242696 environmental testing

Description	Make	Type	Serial No.	Calibration Intervals	Last Calibrated	Next Due Calibration
Integrated Sound Level Meter	Rion	NL-52	<u>00242696</u>	2 YEARS	04.05.2016	04.05.2018
12.5mm Microphone (with windshield)	Rion	UC-59	<u>06178</u>	2 YEARS	04.05.2016	04.05.2018
Microphone Pre – Amplifier	Rion	NH-25	<u>32724</u>	2 YEARS	04.05.2016	04.05.2018

Full calibration certificates are available upon request.

6 RESULTS

6.1 POSITION 1

14 th – 15 th September 2017 – POSITION 1												
Date / Time	LAeq	LAmax	Octave Band Centre Frequency (Hz)									
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
DAYTIME AVERAGE LAeq 16 HOUR	60.4	77.2	65.0	60.9	58.3	54.7	50.8	54.3	55.5	52.8	34.9	22.4
NIGHT TIME AVERAGE LAeq 8 HOUR	51.9	69.2	54.6	53.4	50.0	46.0	43.6	46.6	46.9	43.3	24.7	14.1

15 th – 16 th September 2017 – POSITION 1												
Date / Time	LAeq	LAmax	Octave Band Centre Frequency (Hz)									
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
DAYTIME AVERAGE LAeq 16 HOUR	60.4	76.2	63.7	60.2	58.1	54.3	50.6	53.9	55.6	53.1	35.2	22.2
NIGHT TIME AVERAGE LAeq 8 HOUR	53.7	71.9	54.5	53.3	50.4	45.9	43.6	47.3	49.3	45.8	28.1	16.0

16 th – 17 th September 2017 – POSITION 1												
Date / Time	LAeq	LAmax	Octave Band Centre Frequency (Hz)									
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
DAYTIME AVERAGE LAeq 16 HOUR	54.7	74.8	60.9	58.2	55.8	52.0	48.1	49.8	49.2	43.3	23.9	13.5
NIGHT TIME AVERAGE LAeq 8 HOUR	48.8	66.4	54.8	52.2	48.7	46.0	42.6	44.4	42.9	36.8	19.2	12.0

6.2 POSITION 2

14 th – 15 th September 2017 – POSITION 2												
Date / Time	LAeq	LAmax	Octave Band Centre Frequency (Hz)									
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
DAYTIME AVERAGE LAeq 16 HOUR	55.5	76.2	61.6	60.9	57.2	53.4	50.8	51.2	48.9	40.8	37.8	17.2
NIGHT TIME AVERAGE LAeq 8 HOUR	48.1	68.0	54.6	54.9	50.4	47.3	44.4	44.1	40.0	32.2	30.8	15.0

15 th – 16 th September 2017 – POSITION 2												
Date / Time	LAeq	LAmax	Octave Band Centre Frequency (Hz)									
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
DAYTIME AVERAGE LAeq 16 HOUR	55.1	75.6	61.8	60.7	57.0	53.5	50.6	50.4	48.8	40.2	37.1	16.3
NIGHT TIME AVERAGE LAeq 8 HOUR	46.9	66.1	52.5	53.6	48.9	44.9	43.3	43.0	38.8	31.4	31.8	15.1

16 th – 17 th September 2017 – POSITION 2												
Date / Time	LAeq	LAmax	Octave Band Centre Frequency (Hz)									
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
DAYTIME AVERAGE LAeq 16 HOUR	52.9	72.6	59.4	58.9	55.2	51.9	48.6	48.8	45.9	35.9	32.5	15.5
NIGHT TIME AVERAGE LAeq 8 HOUR	49.3	65.5	55.2	55.1	50.6	47.6	44.8	45.6	41.2	33.9	35.2	15.7

The following noise levels have been corrected for the highest recorded façade levels and used within the BS 8233: 2014 calculations.

6.3 POSITION 1

14 th – 17 th September 2017 – POSITION 1												
Date / Time	LAeq	LAmax	Octave Band Centre Frequency (Hz)									
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
DAYTIME AVERAGE LAeq 16 HOUR	60.6	78.9	65.9	61.7	59.4	55.7	52.6	54.4	55.6	52.7	35.6	24.9
NIGHT TIME AVERAGE LAeq 8 HOUR	53.7	71.9	54.5	53.3	50.4	45.9	43.6	47.3	49.3	45.8	28.1	16.0

6.4 POSITION 2

14 th – 17 th September 2017 – POSITION 2												
Date / Time	LAeq	LAmax	Octave Band Centre Frequency (Hz)									
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
DAYTIME AVERAGE LAeq 16 HOUR	56.9	80.8	62.2	61.3	58.0	53.9	52.5	52.4	50.0	44.6	41.6	20.8
NIGHT TIME AVERAGE LAeq 8 HOUR	49.8	68.0	56.7	55.8	51.5	48.7	45.7	46.0	41.7	34.5	32.0	14.9

7 DISCUSSION OF RESULTS

It can be seen from the attached graph and downloaded results that the external noise levels have followed the expected path and remained fairly constant throughout the day. The levels then gradually dropped off as the evening progressed and began to rise when morning traffic levels increased.

8 RECOMMENDATIONS

For the purpose of this assessment, the corresponding façade levels will be used within the BS 8233: 2014 calculations in order to evaluate the worst case scenario and select the correct window specification.

Therefore, in order to achieve the required noise levels of $L_{Aeq\ 16\ HOUR}$ 35 dB for habitable rooms daytime and $L_{Aeq\ 8\ HOUR}$ 30 dB for Bedroom at night within the proposed, the following additional acoustic measures have been calculated.

It should be noted that the calculations have been made with the proposed windows closed. Additional calculations were made for the top floor due to the influence of sound transmission into the various rooms via the roof / ceiling i.e. an increased impeding façade. Inputted levels into the calculation sheets have been corrected for distance attenuation and free field in accordance with the aforementioned British Standard.

8.1 Calculation Procedure to BS 8233: 2014

The following calculations have been carried out in order to determine the required window and ventilation specification in order to meet the requirements of BS 8233: 2014.

8.2 Ground Floor Flat 1

Proposed Window Configuration		4 / 16 / 4 with MVHR					
Leqff	The equivalent continuous sound pressure level outside the room elements under consideration						
A0	The reference absorption area of 10m ² and is independent of frequency						
Sf	The total façade area of the room in question						
Swi	The area of the windows in the room						
Sew	The area of the external wall of the room						
Srr	The area of the ceiling of the room (if applicable)						
S	The total area of the elements through which sound enters the room						
Dne	The insulation value of the trickle ventilator (if applicable)						
Rwi	The sound reduction index of the window						
Rew	The sound reduction index of the external wall						
Rrr	The sound reduction index of the ceiling/roof (if applicable)						
A	The equivalent absorption area of the receiving room where $A=0.163V/T$						
Formula	$Leq2=Leqff+10\log[A0/S*10^{(-Dne/10)}+Swi/S*10^{(-Rwi/10)}+Sew/10*10^{(-Rew/10)}+Srr/S*10^{(-Rrr/10)}]+10\log(S/A)+3$						
	Octave Band Centre Frequency (Hz)						
	125	250	500	1000	2000	4000	
Sf	10	10	10	10	10	10	
Sr	0	0	0	0	0	0	
Swi	2.5	2.5	2.5	2.5	2.5	2.5	
Sew	7.5	7.5	7.5	7.5	7.5	7.5	
Srr	0	0	0	0	0	0	
S	10	10	10	10	10	10	
A0	10	10	10	10	10	10	
V	40	40	40	40	40	40	
T (BS8233)	0.50	0.50	0.50	0.50	0.50	0.50	
A	12.8	12.8	12.8	12.8	12.8	12.8	
Daytime Leqff	59.4	55.7	52.6	54.4	55.6	52.7	
Night time Leqff	50.4	45.9	43.6	47.3	49.3	45.8	
Dne	40.0	44.0	45.0	51.0	56.0	56.0	
Rwi	21.1	19.7	31.1	38.2	41.3	38.7	
Rew	40.0	44.0	45.0	51.0	56.0	56.0	
Rrr	28.0	34.0	40.0	45.0	49.0	49.0	
Predicted dB(A) Level Within The Above Room During Daytime Hours (07:00-23:00)		L_{Aeq} 16 HOUR		25.6	dB(A)		
Predicted dB(A) Level Within The Above Room During Night Time Hours (23:00-07:00)		L_{Aeq} 8 HOUR		16.6	dB(A)		

8.3 Glazing (R_{wi})

Octave Band Frequency	125	250	500	1000	2000	4000
4mm glass / 16mm air gap / 4mm glass	21.1	19.7	31.1	38.2	41.3	38.7

8.4 Walls (R_{ew})

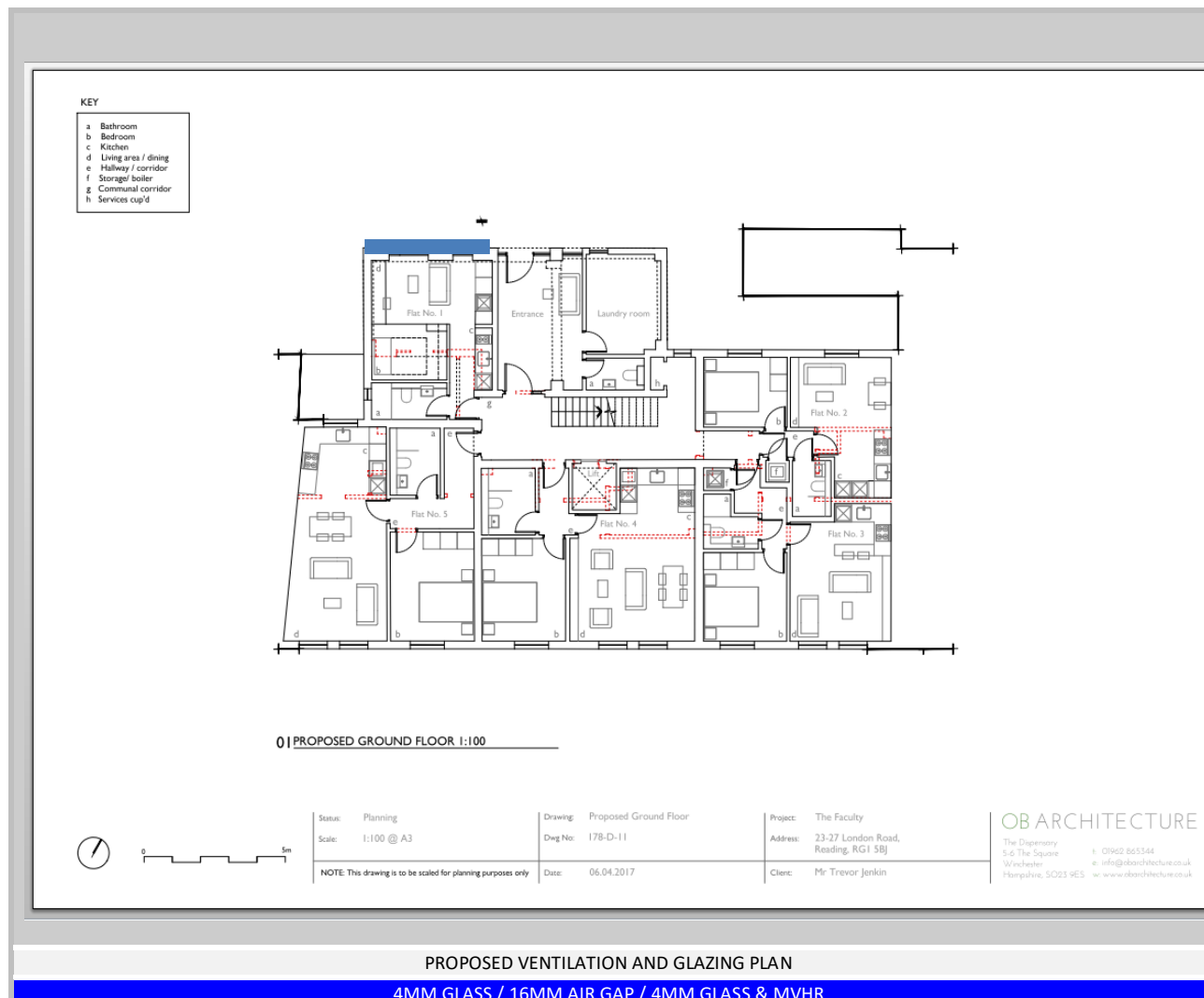
Octave Band Frequency	125	250	500	1000	2000	4000
Brick and Concrete Block	40.0	44.0	45.0	51.0	56.0	56.0

8.5 Roof (R_{rr})

Octave Band Frequency	125	250	500	1000	2000	4000
Minimum Value	28.0	34.0	40.0	45.0	49.0	49.0

The above are minimum construction attenuation values and should alternative methods be selected; these should be equal to or greater than the above corresponding values. Calculations carried out have indicated the following specifications should be installed for this site

9 ASSESSMENT



The proposed flat should be designed with a 4mm glass / 16mm air gap / 4mm glass double glazed windows and a mechanical ventilation heat recovery unit to ensure the internal noise levels are acceptable in terms of the assessment to British Standard 8233: 2014 and to discharge condition 5 of the planning permission granted.

10 NIGHT NOISE GUIDELINES EUROPE 2009

The Night Noise Guidelines 2009 make direct reference to the World Health Organisations Guidelines for Community Noise 1999 with recommended guideline criteria of L_{Aeq} 30 dB indoors for continuous noise. The document goes on to explain that sleep disturbance correlates best with L_{Amax} and effects have been observed at 42 dB or less. This is particularly true if the background noise level is low. Noise events exceeding 42 dB(A) should therefore be limited.

It should be noted that BS 8233: 2014 makes no reference to a criteria under this British Standard to L_{Amax} dB limits within bedrooms at night. The aforementioned documents are Guidelines and therefore should be used for reference purposes only.

Section 8.2 calculates an internal bedroom level at night of $L_{Aeq\ 8\ HOUR}$ 16.6 dB. The corresponding night time external level of $L_{Aeq\ 8\ HOUR}$ 53.7 dB was calculated as detailed within this report thus giving an overall façade attenuation of 37.1 dB. Applying this to the L_{Amax} 42 dB level above results in an L_{Amax} target level of L_{Amax} 79.1 dB.

There have been a few periods where this value has been exceeded within the measurement; therefore, it has been specified with a mechanical ventilation heat recovery in order to discharge condition 5 of the planning permission application number 170576.

11 COMMERCIAL NOISE

11.1 PLANT NOISE

The proposed development site neighbours a commercial takeaway. The takeaway is open from 5pm to 11pm, Monday to Saturday. It can be seen from the results that although the takeaway opens at 5pm the extract is switched on at approximately 2pm. A free field noise level was recorded at 12m from the takeaway extract of 51.0 dB and a free field noise measurement at 7m of 54.7 dB. This has determined a sound power level of 84.1 dB(A) from the kitchen extract, with a resultant level at the nearest noise sensitive window of 52 dB(A). There is a takeaway directly next door (Zaks café and grill) at the time of assessment this premises was currently closed down and therefore no measurement of their plant was recorded, as it was not operational.

No other specific noise sources were identified at the site that could be considered a potential acoustic issue to the proposed development.



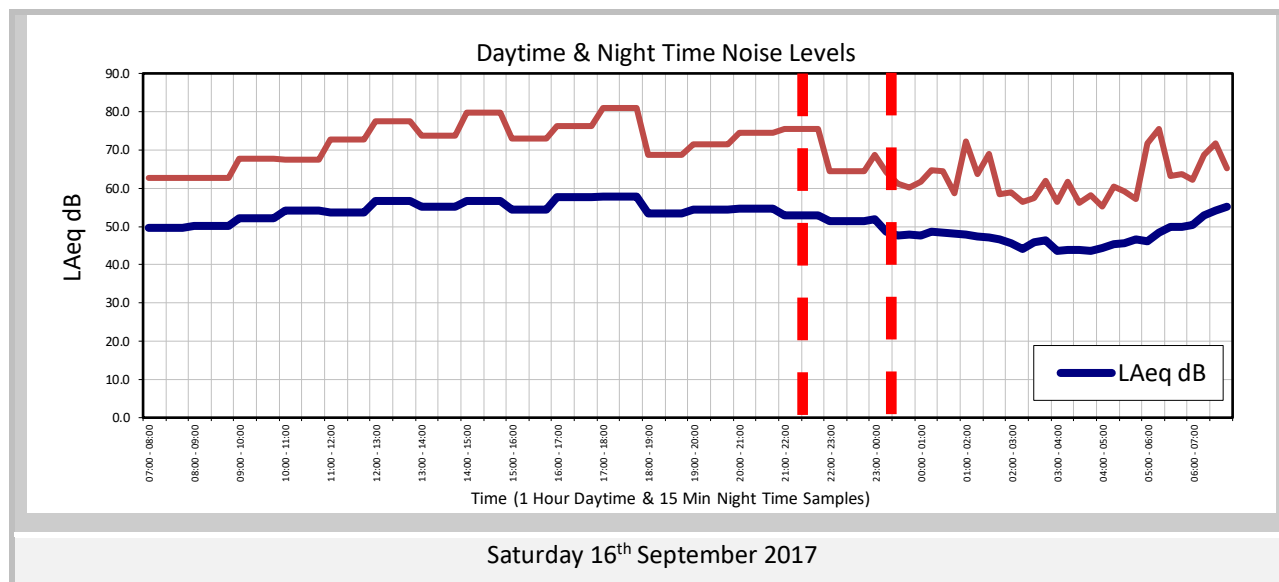
11.2 3D SCREENSHOT

The below 3D screenshot shows the location of the kitchen extract and the free field measurements that were taken.



11.3 Public House (The Turks)

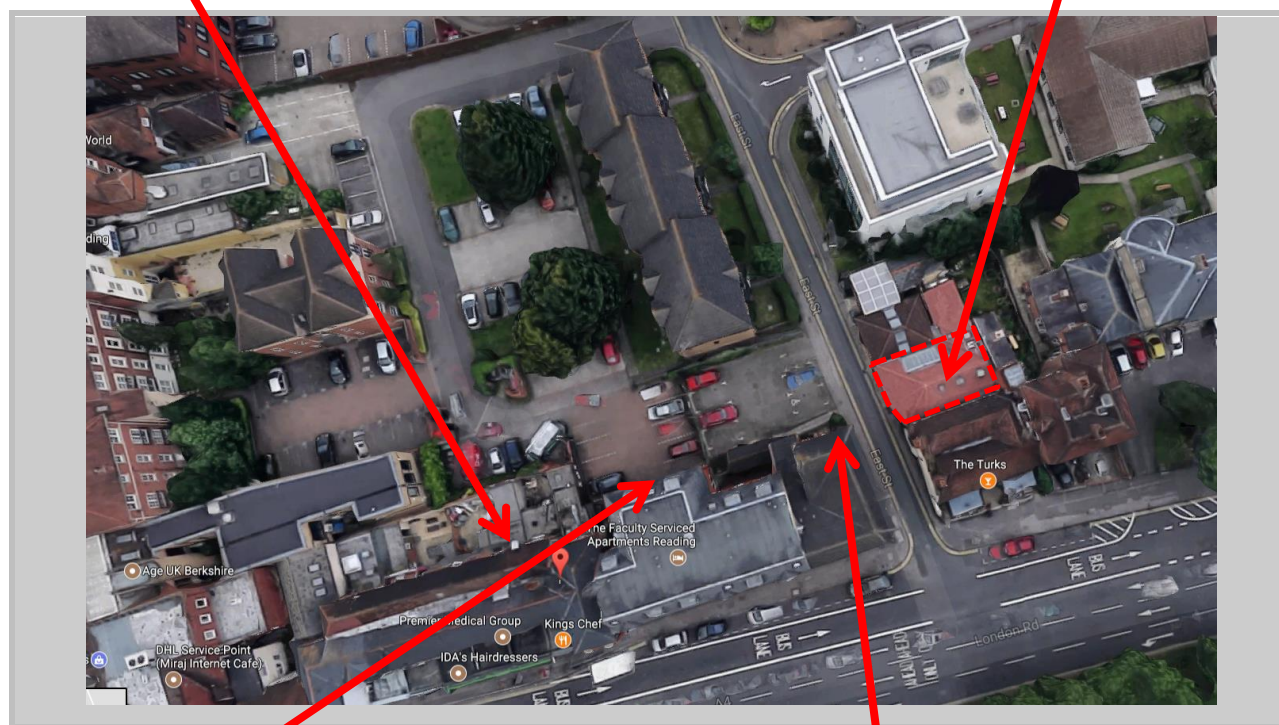
The Turks public house is also a music venue, which has live music on a Saturday night. We spoke to the manager of the pub and he told us that the music is in the room at the rear of the pub as shown in the picture below. During the assessment period the public house had a live music event on Saturday 16th September 2017, which started at 9pm and finished at 11pm. The graph below demonstrates that there was no difference between the prevailing background noise levels at the start of the event and the drop off at 11pm is considered negligible.



The below photograph shows the location of the music in the public house, as well as the receiver position and the closest noise sensitive premises, which in this case is the residential properties on the corner of London Road and East Street.

Kitchen Extract

Music venue



Assessment Position

Closest noise sensitive premises

11.4 Code of Practice on The Control of Noise From Pubs And Clubs:

The Institute of Acoustics derived the above code of practice to target the specific low frequency content of music which is the most likely area of the frequency spectrum to cause noise complaints at residential or noise sensitive dwellings. This is likely due to the larger amounts of energy produced at the lower end of the frequency spectrum.

Section 5.2.3 of the above document states:-

The $L_{Aeq,5min}$ level measured 1 meter outside a window to a habitable room, with entertainment taking place, shall show no increase when compared with the representative $L_{Aeq, 5min}$ level measured from the same position, under the same conditions and during a comparable period with no entertainment taking place; and

The $L_{Aeq,5min}$ level in the 63 Hz and 125 Hz octave band measured 1 meter outside a window to a habitable room, with entertainment taking place, shall show no increase when compared with the representative $L_{Aeq,5min}$ level in the 63 Hz and 125 Hz octave bands measured from the same position, under the same conditions and during a comparable period with no entertainment taking place.

The following tables demonstrate the calculated levels compared directly with the background noise levels taken at the lowest period during the existing operational hours.

A typical music spectrum at these frequencies would result in the following levels

The following recorded levels at residential at 63 Hz and 125 Hz have been calculated from the attenuation differential between the recorded lowest background noise levels and the CADNA A calculated levels at residential. This allows us to calculate the specific frequencies at the residential dwelling representative to that of the calculated level at residential.

9pm – 10pm	dB(A)	63 Hz	125 Hz
Recorded External Noise Level @ Pos.1	52.8	55.5	54.5
Background Noise Level @ Pos.1 (8pm-9pm)	54.5	56.9	56.6
Excess Over Background	-1.7	-1.4	-2.1

10pm – 11pm	dB(A)	63 Hz	125 Hz
Recorded External Noise Level @ Pos.1	51.5	55.3	53.3
Background Noise Level @ Pos.1 (11pm-11:15pm)	52.0	53.4	54.8
Excess Over Background	-0.5	+1.9	-1.5

There appears to be a 2 dB increase at in the 63 Hz band although this increase should be considered negligible given the fluctuating background and ambient noise levels within this area during these times.

The following tables demonstrate the corresponding noise levels from alternative nights at the same time

Friday 15 th September 2017	dB(A)	63 Hz	125 Hz
8pm – 9pm	58.0	57.6	54.3
9pm – 10pm	56.6	56.2	53.0
10pm – 11pm	58.8	57.5	55.7
11pm – 11:15pm	61.0	57.5	58.6
Operational Noise Levels	52.8	55.5	54.5

It should be noted that despite the marginal increase in the 63Hz band, the public house is positioned with existing residential developments closer to their venue than the proposed residential development. Furthermore, the proposed dwelling is a small extension to the existing larger development already completed, occupied and completed with granted planning permission.

12 BS4142: 2014 NOISE ASSESSMENT

12.1 Scope of British Standard 4142: 2014

In the assessment of the existing surrounding commercial premises, consideration has been given to the scope of British Standard 4142: 2014, which in section 1, details applicability of this standard to rating assessing sound of an industrial and/or commercial nature. It is considered appropriate that both the background noise levels and the rating noise levels obtained fall within the scope of British Standard 4142: 2014 by using outdoor sound levels to assess the effect of sound on local residents.

12.2 Terms and Definitions

Symbol	Term	Definition
AP	Assessment Position	Position externally at the façade property under investigation at which the assessment is undertaken which is usually 1m from the 1 st floor bedroom window.
EP	Equivalent Position	Position at which the background noise levels are measured if there is no access to the assessment position or if source under investigation is audible.
$L_s = L_{Aeq, T}$	Specific Level	The average continuous equivalent sound pressure level of the source at the assessment position.
$L_{Ar, Tr}$	Rating Level	The average continuous equivalent sound pressure level of the source at the assessment position with a correction to account for the characteristic features.
$L_r = L_{Aeq, T}$	Residual Level	The average continuous equivalent sound pressure level at the assessment position without the source operating.
$L_{A90, T}$	Background Level	The sound pressure level that is not exceeded 90% of the time at the assessment position.
$L_a = L_{Aeq, T}$	Ambient Level	The totally encompassing sound at the assessment position including the residual and specific noise.

12.3 Calculations

The specific noise levels are calculated at the assessment position located at the residential property above the site using the calculations detailed within ISO 9613 Part 1 and 2: 1996. These calculations take the manufacturers sound power levels into account for a variety of factors including source directivity, distance, atmospheric absorption, ground absorption and the effects of any barriers and determine the resultant noise levels at the assessment position.

12.4 Equivalent Position

The background noise levels were measured at the equivalent position 1 at the rear façade of the building.

12.5 Rating Levels (Character Correction)

It is appropriate to add a character correction where there is a new source that cannot be measured in line with BS4142: 2014. There are 3 methods for approaching this.

- a) Subjective method
- b) Objective method (for tonality)
- c) Reference method

12.6 Subjective Method

The subjective method establishes a rating penalty that is added to the specific noise level if any of the following is present at the assessment position. If a tone is expected to be present a character correction of 0 dB to 6 dB is added depending on how perceptible it is at noise sensitive locations.

BS4142:2014 – Section 9.2 Subjective Method	Perceptibility to noise sensitive facades	Correction
Tonality Ranging from not tonal to prominently tonal	Not tonal	+0
	Just perceptible	+2
	Clearly perceptible	+4
	Highly perceptible	+6

If the source is expected to be impulsive a character correction of 0 dB to 9 dB is added depending on how perceptible it is at noise sensitive locations.

BS4142:2014 – Section 9.2 Subjective Method	Perceptibility to noise sensitive facades	Correction
Impulsivity Considering both the rapidity and any overall change in sound levels	Not impulsive	+0
	Just perceptible	+3
	Clearly perceptible	+6
	Highly perceptible	+9

When the sound features are neither tonal nor impulsive, a character correction of +3 is added for the readily distinctive quality against the acoustic environment or for the intermittency of the source.

BS4142:2014 – Section 9.2 Subjective Method	Perceptibility to noise sensitive facades	Correction
Readily Distinctive	Is not present	+0
	Is present	+3
Intermittency	Is not present	+0
	Is present	+3

12.7 Assessment Criterion

The significance of the resulting noise on the residential property depends on the margin by which it exceeds the background noise levels. British Standard 4142: 2014 provides the following guidance within section 11.

Difference	Assessment of Impact
+10 dB	Indication of a significant adverse impact
+5 dB	Indication of an adverse impact
+0 dB	Indication of low impact

12.8 Noise Meter Floor

BS 4142: 2014 suggests that Care is necessary in circumstances where background sound levels are low to ensure that self-generated and electrical noise within the measurement system does not unduly influence reported values, which might be the case if the measured background sound levels are less than 10 dB above the noise floor of the measuring system. The floor of a typical class 1 noise meter is in the region of 14 dB(A) and therefore measurements of less than 24 dB(A) should be assessed with care.

12.9 BS 4142: 2014 Penalties

Whilst BS 4142: 2014 allows receptor assessments to be made to achieve levels equal to prevailing background noise levels, it also ensures that appropriate and more stringent penalties are applied to the specific noise level to ensure the correct level of protection for the local residents.

12.10 BS 4142: 2014 Noise Assessment - Daytime

Results	Daytime (07:00 – 23:00)
Calculated Ambient Sound Level	$L_{Aeq} = 52 \text{ dB}$
Residual Sound Level	$L_{Aeq} = 53 \text{ dB}$
Background Sound Level	$L_{A90} = 47 \text{ dB}$
Specific Sound	$L_{Aeq} = 52 \text{ dB}$
Acoustic Feature Correction +2 dB Tonality +3 dB Impulsivity	+5 dB
Rating Level	$L_{Aeq} = 57 \text{ dB}$
Background Sound Level	$L_{A90} = 47 \text{ dB}$
Excess of Rating Over Background Sound Level	+10 dB
Assessment Indicates	Significant Adverse Impact

12.11 Tonal Penalty

A +2 dB penalty has been applied to the specific noise level to allow for any minor tonal elements that may be present from the existing site.

12.12 Impulsivity

A +3 dB penalty has been applied to the specific noise level to allow for any minor tonal elements that may be present from the existing site.

12.13 Assessment Conclusion

It can be seen from the above assessments that the existing plant has returned an assessment conclusion of Significant Adverse Impact. Therefore it is recommended that the chinaman's hat is removed from the top of the extract and replaced with a lined bend. This should be manufactured to complement the existing dimensions of the extract, be turned through 90° away from the development and lined with 50mm barrifire foam. However, these recommendations fall outside the control off the development and could be difficult to enforce. It should be noted that the planning permission solely relates to resulting internal noise in accordance with BS8233:2014 which falls outside the scope of BS4142:2014.

13 NPPF & NPSE

The National Planning Policy Framework 2012 (NPPF) and assessments to the Noise Policy Statement for England 2010 (NPSE) should be made in conjunction with each other. Paragraph 123 of the National Planning Policy Framework (NPPF) states the following:

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;
- recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
- Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

The Noise Policy Statement for England gives various levels of effect as detailed within this report.

With the glazing / ventilation specifications achieved within this report, the development can be implemented within the guidelines of the aforementioned documents and ensure a development conclusion of **NOEL – No Observed Effect Level**. This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

14 CONCLUSION

Levels have been recorded and assessments made in accordance with the relevant standards. Internal criteria's have been set and calculations made in order to determine the minimum construction details required in order to meet the desired level within the proposed residential dwellings and satisfy the local council's requirements.

The development should be designed with a 4mm glass / 16mm air gap / 4mm glass double glazed windows and a mechanical ventilation heat recovery for all rooms to ensure the internal noise levels are acceptable in terms of the assessment to British Standard 8233: 2014 and planning condition 5.

Condition 5 of the planning permission granted, application number 170576 can be discharged by installing a mechanical ventilation heat recovery unit.

The development does not propose external living areas and therefore assessments to the World Health Organisation's 'Guidelines for Community Noise' have not been carried out within this technical report.

This report and subsequent calculations and assessments have demonstrated that mitigation measures can be introduced to the site in order to ensure compliance with BS 8233: 2014 for predicted internal noise levels within dwellings.

The extract from the adjacent takeaway has been assessed and shown the noise level at the nearest effected window will be 52.0 dB(A) which is +10.0 dB(A) over background during the day, which demonstrates a Significant Adverse Impact. Therefore it is recommended that the chinaman's hat is removed from the top of the extract and replaced with a lined bend. This should be manufactured to complement the existing dimensions of the extract, be turned through 90° away from the development and lined with 50mm barrifire foam. However, these recommendations fall outside the control off the development and could be difficult to enforce.

Section 14 of the National Planning Policy Framework 2012 suggests that planning permission should be granted unless any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in the framework taken as a whole, or specific policies in the framework indicate the application should be restricted.

Based on the calculations and assessments made within this report it is the professional opinion of Sound Advice Acoustics Ltd that the proposed development can demonstrate compliance with the National Planning Policy Framework 2012, NPPF & NPSE and that, with regards to sound, planning permission can be granted.

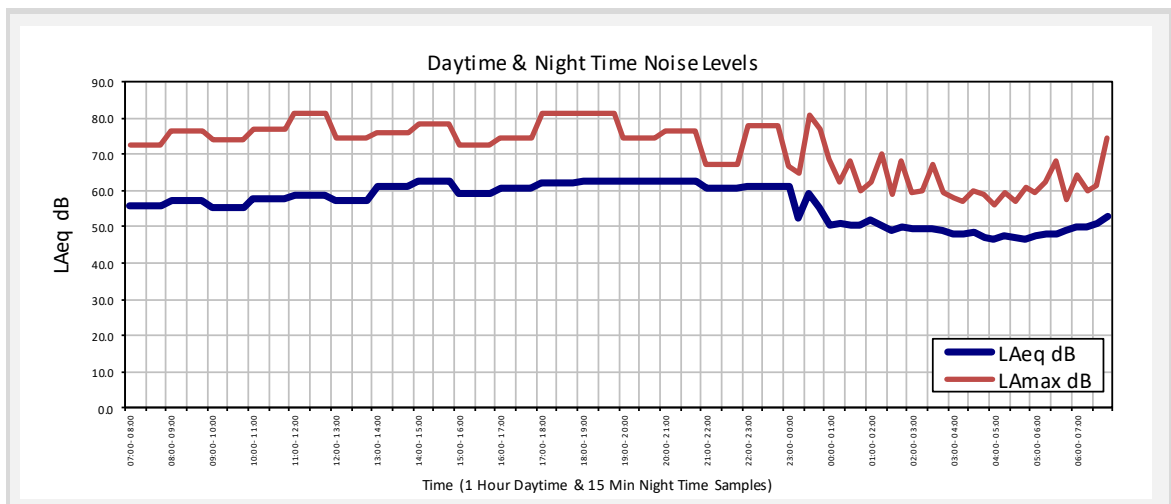
15 RESULTS

15.1 14th – 15th September 2017 Position 1

NOISE LEVEL SUMMARY ASSESSMENT			Octave Band Centre Frequency (Hz)									
Date / Time	LAeq	LAmaz	31.5	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LAeq 16 HOUR & Cor r esponding LAmaz 16 HOUR	60.4	77.2	65.0	60.9	58.3	54.7	50.8	54.3	55.5	52.8	34.9	22.4
NIGHT TIME 23:00 - 07:00 LAeq 8 HOUR & Cor r esponding LAmaz 8 HOUR	51.9	69.2	54.6	53.4	50.0	46.0	43.6	46.6	46.9	43.3	24.7	14.1

DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES												
Date / Time	LAeq	LAmax	Octave Band Centre Frequency (Hz)									
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
07:00 - 08:00	55.7	72.2	63.0	60.3	56.6	52.9	49.3	51.2	49.9	44.5	24.0	12.9
08:00 - 09:00	57.2	76.3	63.7	60.9	56.5	53.4	49.5	52.6	52.3	44.7	25.0	13.8
09:00 - 10:00	55.4	74.1	62.5	60.2	57.9	54.7	50.6	50.4	49.2	42.9	24.0	13.2
10:00 - 11:00	57.7	76.7	63.8	60.0	57.5	54.4	50.0	53.5	52.4	42.7	22.1	13.0
11:00 - 12:00	58.9	81.4	64.4	60.7	58.4	55.1	50.6	54.7	53.9	42.3	24.5	14.1
12:00 - 13:00	57.2	74.2	65.9	61.5	58.9	55.6	50.7	51.5	51.2	48.4	30.3	19.4
13:00 - 14:00	61.1	75.9	66.7	61.5	59.6	56.6	52.4	54.1	56.1	54.2	36.3	23.4
14:00 - 15:00	62.5	78.4	67.8	62.2	58.9	55.9	51.9	56.5	57.4	55.2	37.3	24.9
15:00 - 16:00	59.0	72.3	69.8	64.1	59.2	57.0	51.5	52.8	53.5	51.0	33.0	23.3
16:00 - 17:00	60.5	74.3	67.2	61.9	59.8	54.8	50.6	54.4	55.8	52.5	34.7	22.2
17:00 - 18:00	62.1	81.0	65.3	61.5	59.2	55.0	51.4	55.5	57.3	55.1	37.8	24.3
18:00 - 19:00	62.5	81.0	62.7	60.5	59.1	54.5	51.4	56.8	57.6	54.6	36.7	23.5
19:00 - 20:00	62.7	74.5	62.4	60.5	58.9	54.9	51.9	55.9	57.8	56.1	38.4	26.2
20:00 - 21:00	62.7	76.3	60.6	58.1	57.4	53.1	50.4	55.7	57.9	56.3	38.1	24.9
21:00 - 22:00	60.4	67.0	59.7	57.7	56.7	51.1	49.1	53.2	55.7	54.1	36.0	22.8
22:00 - 23:00	61.3	77.8	58.7	56.8	55.9	51.0	49.4	54.6	56.7	54.6	36.7	23.7

NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES												
Date / Time	LAeq	LAmax	Octave Band Centre Frequency (Hz)									
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
23:00 - 23:15	61.0	66.6	57.2	55.9	55.5	50.6	49.3	53.8	56.4	54.9	36.9	23.8
23:15 - 23:30	52.1	64.6	57.3	55.1	51.2	48.2	45.5	47.4	46.8	41.0	20.5	11.9
23:30 - 23:45	59.0	80.7	56.4	55.3	53.6	48.8	47.5	51.6	54.8	52.3	34.2	21.2
23:45 - 00:00	55.4	76.8	55.7	53.8	49.2	45.8	44.5	51.8	50.5	42.4	20.6	17.1
00:00 - 00:15	50.6	68.6	54.4	52.9	49.7	45.7	43.5	46.2	45.3	39.5	20.3	11.8
00:15 - 00:30	50.7	62.2	55.6	54.7	50.2	47.2	43.7	46.0	45.4	39.8	18.7	13.8
00:30 - 00:45	50.4	67.9	55.0	54.5	54.4	45.4	43.0	45.9	45.0	39.0	17.7	11.3
00:45 - 01:00	50.4	59.7	56.0	54.5	49.9	44.9	43.3	45.8	45.3	39.4	18.3	11.2
01:00 - 01:15	51.7	62.3	56.8	55.0	48.5	45.5	44.1	47.3	46.7	40.7	19.6	11.9
01:15 - 01:30	50.5	69.9	53.8	54.5	49.5	44.6	43.2	45.6	45.2	40.5	17.9	11.1
01:30 - 01:45	48.7	59.1	53.8	53.3	48.5	44.0	42.0	44.1	43.3	37.9	17.2	11.5
01:45 - 02:00	50.0	67.9	54.9	53.6	48.8	44.6	43.2	45.6	44.5	39.0	17.8	11.1
02:00 - 02:15	49.6	59.6	55.3	54.7	50.2	45.4	43.3	44.9	44.2	38.6	17.0	11.1
02:15 - 02:30	49.3	60.1	53.4	53.9	48.1	44.1	42.5	44.8	43.8	38.3	17.1	11.2
02:30 - 02:45	49.3	67.1	54.9	53.7	49.2	45.4	43.5	44.7	43.5	37.7	17.8	11.2
02:45 - 03:00	48.9	59.6	53.7	53.9	49.2	45.3	42.7	44.2	43.3	37.5	16.9	11.0
03:00 - 03:15	48.0	57.8	53.0	53.1	48.2	43.6	42.0	43.6	42.3	36.6	16.1	11.1
03:15 - 03:30	48.1	57.1	51.6	51.6	48.4	43.7	41.9	43.6	42.5	36.7	15.7	11.0
03:30 - 03:45	48.3	59.8	53.9	51.1	47.9	43.6	42.0	44.0	42.6	36.7	15.7	11.1
03:45 - 04:00	47.0	59.0	52.0	51.1	45.8	42.4	40.3	42.6	41.6	35.4	14.9	10.9
04:00 - 04:15	46.5	56.2	51.5	50.4	45.3	42.0	40.4	42.1	40.8	34.8	14.6	10.9
04:15 - 04:30	47.5	59.6	51.9	51.3	50.3	44.7	41.5	42.7	41.7	35.5	19.9	11.0
04:30 - 04:45	46.9	57.0	50.0	49.1	45.8	43.0	40.5	42.7	41.2	34.7	15.4	11.0
04:45 - 05:00	46.6	60.7	53.6	53.0	44.8	42.1	40.4	42.5	40.8	34.8	14.6	10.9
05:00 - 05:15	47.6	59.5	53.8	52.8	47.2	43.9	41.5	43.2	41.9	35.6	15.3	10.9
05:15 - 05:30	48.1	62.1	52.5	50.4	47.0	45.0	41.5	44.1	42.3	35.4	16.0	11.1
05:30 - 05:45	47.9	68.1	52.1	49.9	48.2	45.1	42.0	43.5	42.1	35.9	15.4	10.9
05:45 - 06:00	48.7	57.6	53.0	51.6	48.6	44.6	42.5	44.8	42.8	35.8	18.3	11.3
06:00 - 06:15	49.8	64.0	54.7	52.9	49.7	46.0	43.4	45.5	44.0	38.6	20.5	11.2
06:15 - 06:30	49.9	60.0	55.3	53.9	50.6	49.3	44.2	44.9	43.9	38.1	17.7	11.2
06:30 - 06:45	50.7	61.1	55.3	52.6	50.8	47.7	44.3	46.3	45.3	38.5	17.7	11.1
06:45 - 07:00	52.6	74.6	56.3	55.2	52.5	50.0	46.1	47.9	47.2	40.6	20.2	12.3

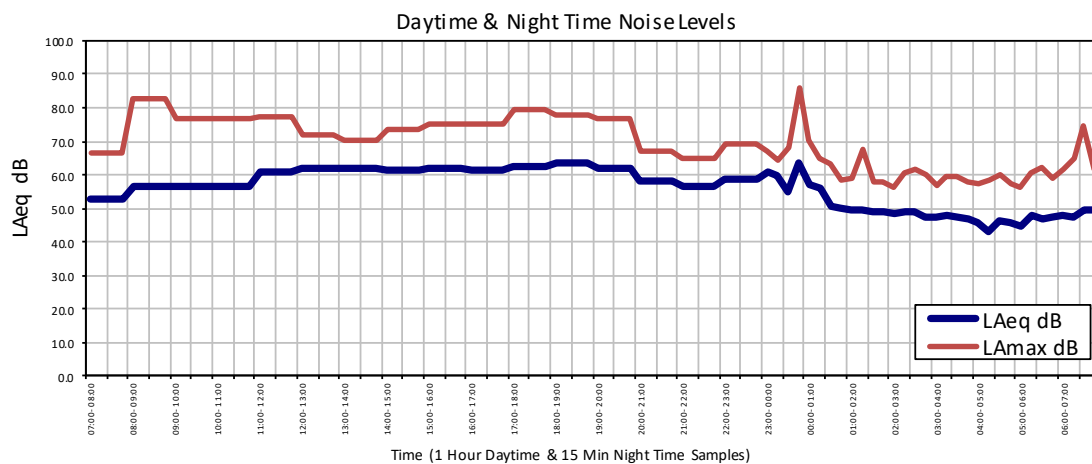


15.2 15th – 16th September 2017 Position 1

NOISE LEVEL SUMMARY ASSESSMENT												
		Octave Band Centre Frequency (Hz)										
Date / Time	L _{Aeq}	L _{Amax}	31.5	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 L_{Aeq} 16 HOUR & Cor r esponding L_{Amax} 16 HOUR	60.4	76.2	63.7	60.2	58.1	54.3	50.6	53.9	55.6	53.1	35.2	22.2
NIGHTTIME 23:00 - 07:00 L_{Aeq} 8 HOUR & Cor r esponding L_{Amax} 8 HOUR	53.7	71.9	54.5	53.3	50.4	45.9	43.6	47.3	49.3	45.8	28.1	16.0

DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES												
		Octave Band Centre Frequency (Hz)										
Date / Time	L _{Aeq}	L _{Amax}	31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
07:00 - 08:00	52.9	66.7	58.9	57.0	54.5	51.5	47.3	48.0	47.1	41.0	20.3	11.6
08:00 - 09:00	56.4	82.6	60.5	58.5	55.0	51.7	48.3	51.7	52.0	41.9	21.2	12.1
09:00 - 10:00	56.3	76.9	61.8	59.2	56.3	53.0	49.7	51.1	51.2	45.1	23.5	12.7
10:00 - 11:00	56.7	76.5	63.8	60.9	60.0	56.5	51.5	52.1	50.3	41.7	19.7	12.0
11:00 - 12:00	60.9	77.0	64.6	61.4	59.8	56.2	52.4	54.6	55.8	52.9	35.1	22.0
12:00 - 13:00	61.9	72.2	66.6	61.9	59.3	55.6	51.5	55.1	56.8	55.3	37.7	24.7
13:00 - 14:00	61.9	70.4	66.4	61.8	59.6	56.4	52.0	55.2	56.7	55.3	37.6	24.6
14:00 - 15:00	61.6	73.3	65.5	61.4	60.3	56.4	52.0	54.2	56.7	54.9	37.1	23.9
15:00 - 16:00	62.1	75.2	65.3	61.5	59.8	55.5	51.6	55.2	57.3	55.1	37.4	24.2
16:00 - 17:00	61.3	75.3	65.1	61.2	59.7	55.4	52.0	54.1	56.5	54.3	36.6	23.5
17:00 - 18:00	62.4	79.6	64.3	61.0	58.7	54.6	50.6	56.0	57.7	55.1	37.4	24.2
18:00 - 19:00	63.3	77.6	64.3	61.0	57.8	54.3	51.7	56.9	58.9	55.6	37.6	24.8
19:00 - 20:00	62.2	76.9	62.1	59.0	56.8	52.4	50.3	55.8	57.6	55.1	37.2	23.9
20:00 - 21:00	58.0	67.0	60.4	57.6	54.3	50.4	48.2	51.4	53.2	51.1	33.3	20.4
21:00 - 22:00	56.6	64.7	58.8	56.2	53.0	49.1	47.0	50.1	51.8	49.3	31.8	18.9
22:00 - 23:00	58.8	69.3	58.1	57.5	55.7	51.2	48.7	51.8	54.0	52.2	34.6	21.6

NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES												
		Octave Band Centre Frequency (Hz)										
Date / Time	L _{Aeq}	L _{Amax}	31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
23:00 - 23:15	61.0	67.3	57.2	57.5	58.6	50.8	49.0	53.4	56.5	54.8	37.1	23.8
23:15 - 23:30	59.9	64.2	57.9	55.8	54.4	49.6	48.5	52.3	55.4	53.5	36.1	22.8
23:30 - 23:45	55.1	67.9	57.2	56.0	52.8	47.3	45.2	48.6	50.5	47.8	29.5	17.0
23:45 - 00:00	63.7	86.1	57.6	56.5	55.2	50.0	49.2	56.9	60.2	55.2	37.3	24.0
00:00 - 00:15	57.3	70.2	54.5	54.6	51.9	47.6	46.5	50.2	52.9	50.5	32.7	19.7
00:15 - 00:30	55.9	64.9	57.5	56.0	52.2	47.4	46.1	49.2	51.2	49.1	31.6	18.9
00:30 - 00:45	50.6	63.4	55.0	54.2	50.9	47.3	44.0	45.9	45.2	39.1	20.0	11.9
00:45 - 01:00	49.8	58.5	54.7	53.4	48.5	44.8	43.4	45.4	44.4	38.1	17.0	11.0
01:00 - 01:15	49.5	59.2	54.8	54.2	49.0	45.0	43.0	45.0	44.0	38.0	17.7	11.2
01:15 - 01:30	49.5	67.8	57.7	55.1	48.8	45.1	42.7	44.4	44.4	38.6	17.5	11.1
01:30 - 01:45	48.8	58.1	55.0	53.7	48.8	44.3	42.2	44.2	43.4	37.2	16.3	10.9
01:45 - 02:00	49.1	57.8	54.3	54.4	50.1	44.7	42.5	44.6	43.6	37.4	17.0	11.0
02:00 - 02:15	48.3	56.5	54.9	52.9	46.7	43.8	42.2	44.1	42.7	36.3	15.3	10.9
02:15 - 02:30	49.0	60.8	54.7	54.6	48.8	44.6	42.6	44.3	43.7	37.7	16.2	10.9
02:30 - 02:45	49.2	61.7	55.0	54.9	50.1	45.3	42.7	44.6	43.7	37.6	16.5	16.1
02:45 - 03:00	47.2	59.8	52.9	52.5	47.6	42.9	41.0	42.6	41.6	35.9	16.1	11.2
03:00 - 03:15	47.5	57.0	52.9	52.4	48.1	44.8	42.0	42.8	41.6	35.7	15.3	10.9
03:15 - 03:30	48.1	59.5	54.1	52.5	47.5	43.9	41.9	43.7	42.5	36.9	15.7	11.1
03:30 - 03:45	47.3	59.7	52.4	50.9	47.6	42.1	40.9	43.0	41.7	35.1	14.6	10.8
03:45 - 04:00	46.9	57.7	51.8	51.9	47.1	43.1	40.8	42.6	41.1	35.1	14.6	11.0
04:00 - 04:15	45.6	57.3	50.1	51.4	44.2	41.0	39.7	41.2	39.8	33.7	14.2	10.8
04:15 - 04:30	43.2	58.6	48.8	47.1	42.5	39.6	38.0	39.0	37.0	31.0	18.1	10.9
04:30 - 04:45	46.1	59.9	51.5	49.2	45.6	40.9	39.3	42.0	40.5	34.2	15.4	11.4
04:45 - 05:00	45.7	57.2	50.0	48.1	45.8	46.4	39.4	41.1	39.5	33.0	13.5	10.8
05:00 - 05:15	44.6	56.2	50.1	49.7	43.2	40.4	38.4	40.4	38.9	32.6	13.4	10.8
05:15 - 05:30	47.7	60.6	51.9	49.0	46.0	43.2	40.9	43.2	42.2	37.2	20.6	11.1
05:30 - 05:45	46.9	62.0	52.6	49.7	47.6	47.1	40.6	41.8	41.0	35.1	22.8	11.8
05:45 - 06:00	47.2	58.7	52.7	50.1	45.4	42.8	40.9	43.0	41.6	35.4	24.6	11.2
06:00 - 06:15	47.7	61.9	51.2	49.8	47.0	46.4	41.4	42.9	41.4	38.4	23.0	11.2
06:15 - 06:30	47.4	65.0	52.8	49.6	47.8	46.0	41.1	42.8	41.1	36.6	24.0	11.1
06:30 - 06:45	49.7	74.6	54.2	52.2	49.9	46.2	42.9	44.8	44.6	38.0	21.8	12.2
06:45 - 07:00	49.7	61.4	54.6	52.5	51.3	46.7	44.0	45.1	44.3	36.9	17.1	11.7

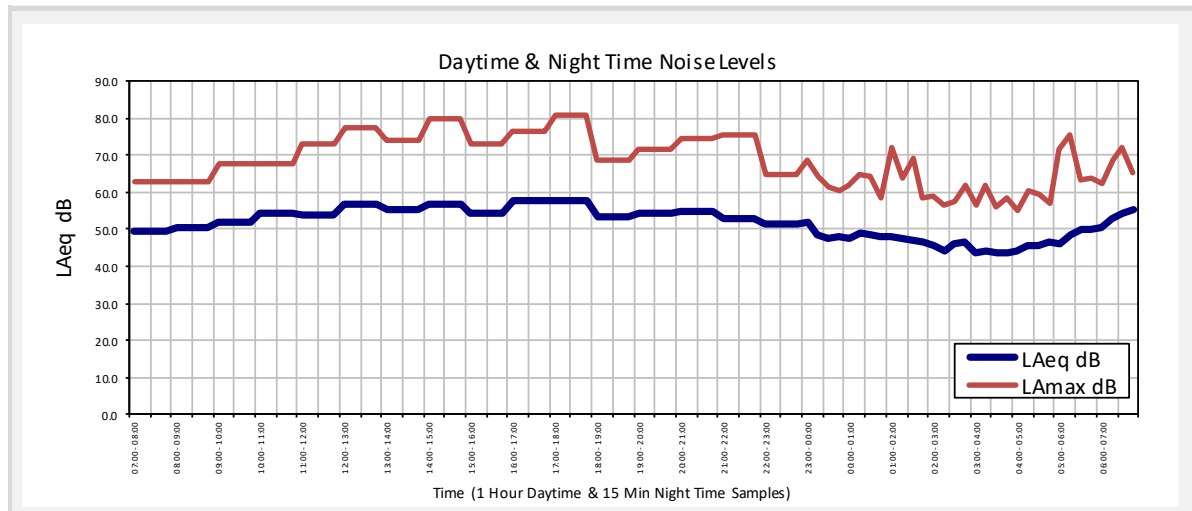


15.3 16th – 17th September 2017 Position 1

NOISE LEVEL SUMMARY ASSESSMENT		Octave Band Centre Frequency (Hz)										
Date / Time	L _{Aeq}	L _{Amax}	31.5	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 L_{Aeq} 16 HOUR & Cor r esponding L_{Amax} 16 HOUR	54.7	74.8	60.9	58.2	55.8	52.0	48.1	49.8	49.2	43.3	23.9	13.5
NIGHT TIME 23:00 - 07:00 L_{Aeq} 8 HOUR & Cor r esponding L_{Amax} 8 HOUR	48.8	66.4	54.8	52.2	48.7	46.0	42.6	44.4	42.9	36.8	19.2	12.0

DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES		Octave Band Centre Frequency (Hz)										
Date / Time	L _{Aeq}	L _{Amax}	31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
07:00 - 08:00	49.6	62.7	55.1	52.8	50.0	46.3	42.6	45.2	44.4	37.2	18.3	11.3
08:00 - 09:00	50.2	62.6	56.4	53.8	51.3	47.8	44.1	45.7	44.6	37.2	17.2	11.1
09:00 - 10:00	52.0	67.7	59.1	56.6	55.2	50.8	47.3	47.3	45.7	39.1	19.7	11.8
10:00 - 11:00	54.1	67.5	61.3	58.8	56.3	53.5	49.9	49.2	47.4	41.0	21.0	12.6
11:00 - 12:00	53.6	72.8	60.9	58.3	54.4	52.2	48.7	49.0	47.4	40.9	21.2	12.1
12:00 - 13:00	56.7	77.5	62.3	60.0	57.3	54.4	49.2	51.3	52.1	43.5	21.4	12.3
13:00 - 14:00	55.3	73.7	63.3	60.2	57.0	52.7	48.4	51.0	49.8	41.6	21.8	12.6
14:00 - 15:00	56.7	79.7	62.5	59.9	56.7	52.2	48.0	51.9	52.2	43.6	23.1	12.4
15:00 - 16:00	54.4	73.0	63.3	59.7	57.7	53.9	49.1	49.2	48.4	41.3	21.6	14.3
16:00 - 17:00	57.7	76.2	63.3	60.0	57.5	53.2	49.8	52.7	52.2	48.8	30.4	18.0
17:00 - 18:00	57.8	81.0	61.9	58.8	56.9	52.9	49.2	53.2	52.4	47.9	29.7	17.4
18:00 - 19:00	53.5	68.6	60.8	58.5	55.0	51.4	48.8	49.1	47.0	40.3	24.3	12.6
19:00 - 20:00	54.5	71.4	59.6	58.7	55.6	50.8	47.4	49.3	49.3	44.2	23.0	12.2
20:00 - 21:00	54.5	74.4	59.9	56.9	56.6	54.4	49.5	49.4	48.1	43.1	21.1	12.5
21:00 - 22:00	52.8	75.6	57.4	55.5	54.5	48.0	45.7	48.1	46.8	44.0	19.8	12.0
22:00 - 23:00	51.5	64.5	56.5	55.3	53.3	47.7	44.5	47.1	45.9	39.6	18.1	11.8

NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES		Octave Band Centre Frequency (Hz)										
Date / Time	L _{Aeq}	L _{Amax}	31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
23:00 - 23:15	52.0	68.7	54.9	53.4	54.8	53.5	47.2	46.7	45.3	38.8	16.7	11.1
23:15 - 23:30	48.6	64.3	54.5	53.8	51.3	45.2	42.2	44.1	42.9	37.3	17.2	11.1
23:30 - 23:45	47.7	61.1	55.0	52.8	48.8	43.9	40.9	43.4	42.1	35.0	14.8	18.6
23:45 - 00:00	47.9	60.2	54.3	51.1	46.4	44.4	41.4	43.5	42.5	36.1	16.2	11.1
00:00 - 00:15	47.6	61.7	53.0	53.1	46.8	43.5	40.9	42.8	42.2	36.8	18.9	11.3
00:15 - 00:30	48.7	64.8	55.6	52.7	47.5	44.0	41.8	44.0	43.5	37.8	18.6	11.8
00:30 - 00:45	48.3	64.4	52.5	51.8	47.8	44.7	42.1	44.0	42.5	36.2	16.2	11.2
00:45 - 01:00	48.0	58.6	54.4	51.8	47.6	44.1	41.2	43.7	42.3	36.7	16.4	11.1
01:00 - 01:15	47.8	72.2	54.4	51.6	47.0	43.5	41.2	43.3	42.4	36.3	16.0	11.1
01:15 - 01:30	47.3	63.6	54.8	53.4	47.7	44.1	41.0	42.7	41.6	35.8	15.7	11.0
01:30 - 01:45	47.1	69.0	52.5	51.4	46.2	44.1	41.9	42.2	41.5	35.4	16.1	11.1
01:45 - 02:00	46.5	58.5	52.1	48.9	45.7	44.3	40.5	42.0	40.7	34.8	14.8	10.9
02:00 - 02:15	45.7	58.8	52.8	52.6	52.6	43.9	39.6	40.3	39.5	33.9	15.1	11.1
02:15 - 02:30	44.2	56.3	49.7	47.8	42.8	40.2	38.5	40.0	38.5	31.9	13.8	10.9
02:30 - 02:45	45.9	57.3	54.4	51.6	45.7	42.2	39.5	41.4	40.4	34.2	14.4	10.9
02:45 - 03:00	46.3	61.9	53.5	51.8	46.3	42.7	40.1	41.7	40.8	34.8	14.7	10.9
03:00 - 03:15	43.6	56.3	50.2	48.8	42.8	42.2	37.8	39.7	37.1	30.4	13.0	10.8
03:15 - 03:30	43.9	61.7	50.6	46.6	43.2	40.8	37.7	39.7	38.1	31.4	13.0	10.8
03:30 - 03:45	43.8	56.1	49.9	47.3	44.2	41.3	38.3	39.7	37.5	31.3	13.6	10.9
03:45 - 04:00	43.7	58.2	50.2	46.6	44.3	43.0	37.8	39.2	37.5	31.1	13.2	10.8
04:00 - 04:15	44.3	55.2	54.2	48.2	46.1	43.7	38.6	39.8	37.8	31.5	13.5	10.8
04:15 - 04:30	45.4	60.4	50.5	47.4	44.5	41.2	39.9	41.1	39.4	33.6	23.0	16.6
04:30 - 04:45	45.6	59.2	50.8	47.4	45.3	42.8	40.4	41.4	39.0	33.3	22.9	11.1
04:45 - 05:00	46.6	57.1	53.0	49.9	45.5	42.9	40.5	42.3	40.8	34.8	21.4	11.0
05:00 - 05:15	46.2	71.6	53.5	48.8	45.1	41.7	39.5	41.5	40.8	35.2	19.1	11.1
05:15 - 05:30	48.4	75.6	55.2	49.5	45.9	43.1	41.5	43.9	43.1	37.5	17.5	11.0
05:30 - 05:45	49.8	63.1	55.3	51.5	48.7	45.5	43.3	45.1	44.3	39.1	23.2	11.4
05:45 - 06:00	50.0	63.7	55.4	52.9	48.9	45.7	43.5	45.7	44.1	39.1	21.2	11.1
06:00 - 06:15	50.3	62.2	56.7	54.1	48.8	47.1	43.6	46.3	44.4	37.8	18.3	11.1
06:15 - 06:30	52.9	68.7	57.4	54.3	51.6	50.7	48.4	48.5	46.6	40.7	21.2	11.9
06:30 - 06:45	54.2	71.8	60.0	55.7	52.6	50.8	47.4	50.2	48.7	41.2	25.9	11.8
06:45 - 07:00	55.1	65.1	61.6	58.9	54.7	51.9	48.5	51.1	49.2	42.4	24.3	12.7

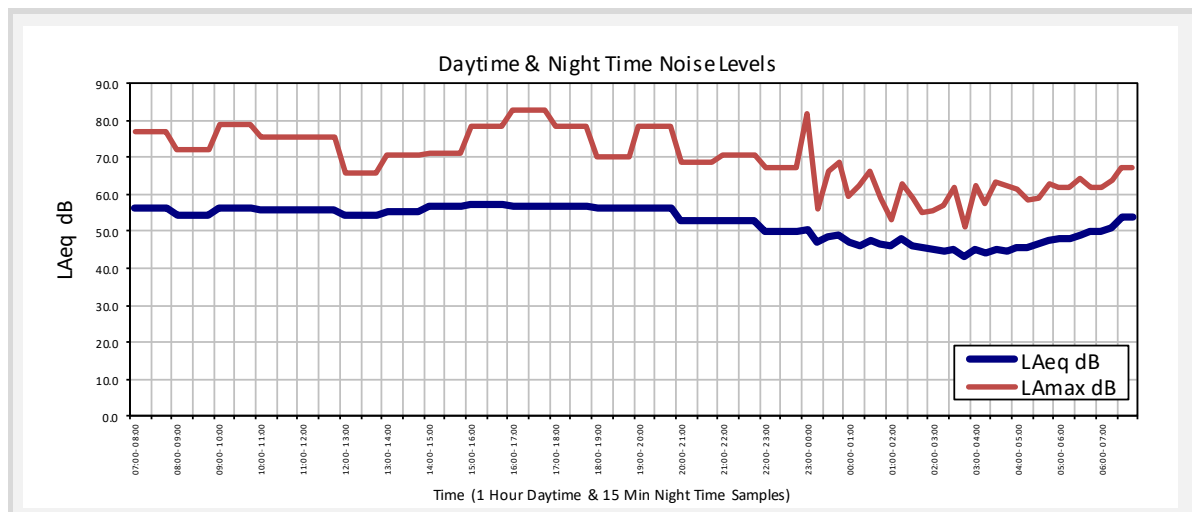


15.4 14th – 15th September 2017 Position 2

NOISE LEVEL SUMMARY ASSESSMENT				Octave Band Centre Frequency (Hz)								
Date / Time	L _{Aeq}	L _{Amax}	31.5	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 L_{Aeq} 16 HOUR & Cor r esponding L_{Amax} 16 HOUR	55.5	76.2	61.6	60.9	57.2	53.4	50.8	51.2	48.9	40.8	37.8	17.2
NIGHT TIME 23:00 - 07:00 L_{Aeq} 8 HOUR & Cor r esponding L_{Amax} 8 HOUR	48.1	68.0	54.6	54.9	50.4	47.3	44.4	44.1	40.0	32.2	30.8	15.0

DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES				Octave Band Centre Frequency (Hz)								
Date / Time	L _{Aeq}	L _{Amax}	31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
07:00 - 08:00	56.2	76.9	62.7	61.6	56.3	53.3	51.0	52.0	50.3	39.3	35.9	16.0
08:00 - 09:00	54.2	71.9	60.9	60.5	57.0	54.7	51.0	49.8	46.0	37.4	34.3	15.3
09:00 - 10:00	56.2	78.9	61.5	60.6	57.1	54.3	51.2	52.3	49.9	37.9	34.4	16.6
10:00 - 11:00	55.6	75.5	61.7	61.2	57.8	54.5	50.9	50.9	49.9	35.9	34.1	15.8
11:00 - 12:00	55.5	75.2	62.2	65.2	60.7	55.5	52.6	50.7	47.1	39.6	35.6	15.9
12:00 - 13:00	54.1	65.7	61.3	60.2	57.5	53.8	50.9	50.2	45.2	36.9	33.1	15.4
13:00 - 14:00	55.2	70.4	62.3	60.5	56.5	53.3	50.8	51.8	47.3	38.4	34.5	15.9
14:00 - 15:00	56.6	70.9	64.3	62.2	58.6	54.8	52.5	52.2	49.0	43.9	41.9	21.2
15:00 - 16:00	57.4	78.5	63.2	61.5	57.1	53.6	51.3	53.8	51.6	40.7	37.1	15.9
16:00 - 17:00	56.5	82.9	63.5	61.9	58.7	54.3	53.2	52.0	48.8	42.2	39.3	16.7
17:00 - 18:00	56.9	78.2	61.9	61.1	58.0	54.2	51.2	52.4	51.7	39.0	34.8	16.1
18:00 - 19:00	56.1	69.9	61.5	60.6	58.5	54.1	51.1	50.9	49.4	45.0	42.3	20.8
19:00 - 20:00	56.0	78.1	60.3	58.2	55.0	51.6	48.3	50.6	51.1	45.1	42.3	18.4
20:00 - 21:00	52.7	68.5	57.5	57.8	54.3	49.1	47.9	48.7	45.6	40.8	38.1	16.4
21:00 - 22:00	52.7	70.6	56.3	56.4	52.5	48.4	47.8	48.9	45.9	38.5	35.5	16.1
22:00 - 23:00	50.0	67.2	54.6	55.3	50.7	46.7	44.9	46.3	43.4	34.8	31.4	15.8

NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES				Octave Band Centre Frequency (Hz)								
Date / Time	L _{Aeq}	L _{Amax}	31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
23:00 - 23:15	50.4	81.6	53.5	53.8	50.1	46.5	44.1	45.1	44.7	39.9	38.1	16.6
23:15 - 23:30	46.9	56.2	53.7	54.8	48.2	44.1	42.5	43.5	39.2	29.7	24.1	17.2
23:30 - 23:45	48.3	66.2	51.8	55.6	51.5	45.1	43.2	44.9	40.8	31.8	27.9	14.8
23:45 - 00:00	48.8	68.7	53.9	54.5	48.6	45.4	43.6	45.6	41.4	33.9	30.7	14.9
00:00 - 00:15	47.2	59.4	53.7	55.0	47.9	44.8	42.8	44.0	39.5	29.9	24.1	14.6
00:15 - 00:30	46.1	62.2	52.4	55.1	48.7	43.9	41.7	42.4	38.7	29.8	22.8	14.6
00:30 - 00:45	47.4	66.2	52.0	55.4	49.5	45.1	43.9	42.9	39.4	34.1	31.3	15.0
00:45 - 01:00	46.4	58.7	52.0	53.3	48.6	44.6	42.0	43.2	38.4	27.7	21.6	14.6
01:00 - 01:15	46.0	53.0	52.4	55.4	48.9	44.9	42.1	42.5	37.3	27.6	21.9	14.6
01:15 - 01:30	48.1	62.7	52.5	56.4	49.2	44.8	43.5	44.5	40.5	33.3	29.9	14.8
01:30 - 01:45	46.1	58.9	52.8	53.7	48.5	45.5	42.5	42.7	36.9	26.4	22.2	14.5
01:45 - 02:00	45.6	55.2	51.3	54.2	47.9	44.4	41.8	42.2	37.1	26.6	21.1	14.5
02:00 - 02:15	45.1	55.7	50.9	53.1	48.8	43.7	41.3	41.7	36.1	26.5	21.2	14.6
02:15 - 02:30	44.6	57.1	49.7	51.7	46.7	42.9	40.3	41.4	36.3	25.9	20.0	14.6
02:30 - 02:45	44.9	61.8	51.4	51.6	46.3	43.0	41.2	41.7	36.2	25.6	19.4	14.5
02:45 - 03:00	43.1	51.0	48.6	51.3	45.6	41.9	39.1	39.8	34.2	24.2	18.7	14.5
03:00 - 03:15	45.2	62.1	50.7	52.9	47.3	43.0	40.8	41.2	36.6	28.8	35.2	14.7
03:15 - 03:30	44.3	57.4	46.8	50.0	46.4	43.9	40.5	40.9	35.3	26.1	21.7	14.6
03:30 - 03:45	45.1	63.1	52.0	53.0	46.0	42.7	40.7	41.8	37.1	28.2	24.4	14.6
03:45 - 04:00	44.8	62.4	51.0	51.4	46.3	43.5	40.4	41.3	36.4	28.8	25.0	14.7
04:00 - 04:15	45.7	61.3	51.4	54.4	47.0	44.8	41.4	42.2	37.4	28.7	26.9	14.9
04:15 - 04:30	45.4	58.2	51.0	50.6	46.5	43.7	41.3	42.2	37.0	27.1	23.0	14.6
04:30 - 04:45	46.7	58.7	51.6	51.6	48.6	45.2	42.2	43.6	38.6	27.8	23.4	14.6
04:45 - 05:00	47.7	62.6	51.5	52.2	48.6	45.6	43.2	44.0	38.8	31.2	38.3	14.9
05:00 - 05:15	48.1	61.9	56.0	54.0	49.5	47.3	43.9	44.3	40.0	32.2	32.3	14.7
05:15 - 05:30	47.9	61.6	55.8	55.7	50.9	49.4	44.2	43.5	38.6	29.7	32.9	14.9
05:30 - 05:45	49.1	64.1	55.8	54.9	51.5	48.0	44.8	45.4	41.1	33.2	30.1	15.0
05:45 - 06:00	49.7	61.8	54.8	55.6	53.4	50.6	46.8	45.5	40.7	30.4	26.1	14.7
06:00 - 06:15	50.0	61.6	54.8	56.4	53.4	51.5	47.1	45.4	40.7	30.4	32.1	14.6
06:15 - 06:30	51.1	63.8	57.0	56.4	52.4	50.3	46.7	47.0	43.7	35.9	33.6	15.4
06:30 - 06:45	53.7	67.2	61.6	59.5	57.0	53.7	50.8	49.0	45.5	38.7	35.9	15.5
06:45 - 07:00	53.6	67.2	62.6	60.8	56.4	54.2	51.9	48.4	44.1	36.6	33.1	15.7

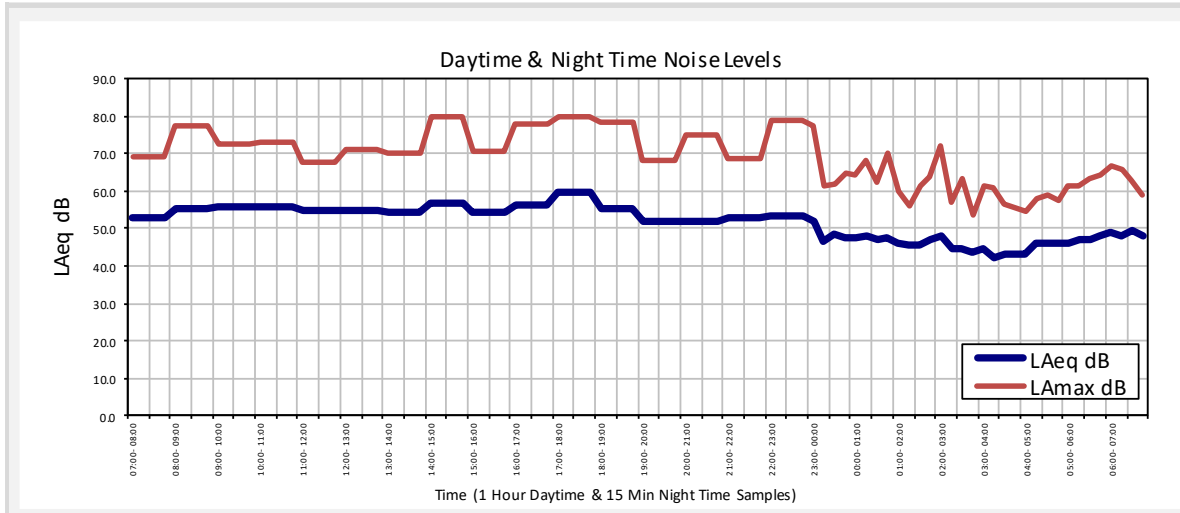


15.5 15th – 16th September 2017 Position 2

NOISE LEVEL SUMMARY ASSESSMENT		Octave Band Centre Frequency (Hz)										
Date / Time	LAeq	LAmaz	31.5	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 LAeq 16 HOUR & Corresponding LAmaz 16 HOUR	55.1	75.6	61.8	60.7	57.0	53.5	50.6	50.4	48.8	40.2	37.1	16.3
NIGHT TIME 23:00 - 07:00 LAeq 8 HOUR & Corresponding LAmaz 8 HOUR	46.9	66.1	52.5	53.6	48.9	44.9	43.3	43.0	38.8	31.4	31.8	15.1

DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES		Octave Band Centre Frequency (Hz)										
Date / Time	LAeq	LAmaz	31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
07:00 - 08:00	52.8	69.0	59.0	58.9	54.3	51.1	48.4	48.8	45.9	35.8	32.0	15.2
08:00 - 09:00	55.3	77.3	60.7	60.0	56.7	53.8	50.6	50.4	49.8	37.2	32.2	15.0
09:00 - 10:00	55.5	72.7	62.5	61.6	59.8	57.3	53.4	50.5	45.3	35.9	31.4	15.1
10:00 - 11:00	55.9	72.9	64.6	62.6	58.4	54.4	52.6	51.3	48.6	39.5	35.5	18.0
11:00 - 12:00	54.5	67.8	63.5	61.7	57.7	54.2	51.4	50.3	46.1	38.6	34.7	15.5
12:00 - 13:00	54.8	70.9	63.6	62.1	58.2	55.1	52.0	50.4	45.8	38.3	34.9	15.6
13:00 - 14:00	54.2	70.0	63.1	61.5	58.5	55.2	51.3	49.4	44.8	37.9	34.1	15.3
14:00 - 15:00	56.6	79.9	63.9	61.6	58.2	54.8	51.9	51.4	47.4	38.5	35.7	15.4
15:00 - 16:00	54.1	70.7	63.4	61.8	58.2	54.6	51.4	49.1	45.3	37.9	34.3	15.8
16:00 - 17:00	56.2	77.8	62.5	61.8	57.4	53.7	50.6	51.7	50.4	41.1	37.9	17.1
17:00 - 18:00	59.5	79.8	62.1	61.1	56.5	53.1	50.7	54.3	55.0	47.7	45.0	20.1
18:00 - 19:00	55.2	78.1	59.7	58.8	54.5	50.5	48.2	51.3	49.4	42.4	39.4	16.4
19:00 - 20:00	51.7	68.3	57.7	58.0	53.2	49.5	47.4	47.6	44.2	38.4	36.3	16.0
20:00 - 21:00	52.0	75.0	57.1	58.9	54.6	48.8	48.0	48.1	44.3	37.5	34.6	15.9
21:00 - 22:00	52.7	68.8	57.0	59.5	56.0	50.3	49.3	48.7	44.6	37.4	33.9	15.8
22:00 - 23:00	53.3	79.0	55.3	56.5	51.4	46.5	45.9	47.8	49.4	38.4	34.8	15.3

NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES		Octave Band Centre Frequency (Hz)										
Date / Time	LAeq	LAmaz	31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
23:00 - 23:15	51.8	77.5	55.9	57.0	54.2	48.4	52.4	45.7	42.3	35.3	31.5	14.9
23:15 - 23:30	46.5	61.1	54.6	55.0	50.2	46.7	42.5	42.7	38.0	28.6	22.6	14.7
23:30 - 23:45	48.4	61.8	54.9	55.3	48.9	45.1	44.1	44.8	41.0	32.9	30.1	15.2
23:45 - 00:00	47.4	64.5	52.0	53.8	48.0	44.4	42.6	44.3	39.8	30.8	26.3	14.8
00:00 - 00:15	47.3	64.0	57.4	56.6	48.1	44.1	42.5	43.6	39.9	33.0	30.4	15.1
00:15 - 00:30	48.1	68.2	53.5	55.6	48.5	45.2	43.3	44.5	41.0	32.9	28.9	14.8
00:30 - 00:45	46.8	62.5	52.8	55.2	48.9	43.9	41.9	43.2	39.6	30.9	25.6	14.7
00:45 - 01:00	47.4	70.0	51.7	53.6	47.6	43.5	44.3	43.8	39.4	29.6	25.4	14.6
01:00 - 01:15	45.8	59.7	51.7	53.7	46.9	43.3	41.6	42.5	37.8	28.1	22.7	14.6
01:15 - 01:30	45.4	56.0	52.4	55.1	48.0	43.5	41.0	41.9	37.5	27.0	20.4	20.2
01:30 - 01:45	45.5	61.5	51.8	54.7	50.1	44.7	41.2	41.7	37.4	28.4	23.7	14.6
01:45 - 02:00	47.0	63.9	51.1	54.9	48.6	45.0	42.5	43.3	39.6	31.7	29.2	14.7
02:00 - 02:15	48.2	72.0	50.8	52.2	47.9	44.4	45.8	44.7	39.6	29.8	23.7	14.6
02:15 - 02:30	44.6	57.0	50.4	52.3	47.4	42.8	40.4	41.5	36.2	25.6	19.2	14.5
02:30 - 02:45	44.4	63.3	48.5	50.4	47.1	42.2	40.7	41.2	35.9	25.4	20.2	14.5
02:45 - 03:00	43.8	53.4	49.4	52.8	46.8	41.6	39.6	40.7	35.2	23.8	18.3	14.5
03:00 - 03:15	44.8	61.5	46.9	50.7	44.9	41.1	39.9	41.3	37.3	29.3	32.0	14.7
03:15 - 03:30	42.0	60.8	47.9	48.4	45.0	39.6	37.6	38.7	33.9	25.6	22.2	14.6
03:30 - 03:45	43.3	56.4	49.9	49.8	46.4	40.8	38.5	40.3	35.1	26.4	20.1	14.5
03:45 - 04:00	42.9	55.6	48.2	49.8	46.2	45.9	38.5	38.8	33.5	22.5	16.7	14.5
04:00 - 04:15	43.2	54.4	49.3	49.2	45.3	41.9	39.1	39.5	34.7	24.7	29.8	14.5
04:15 - 04:30	45.8	57.8	50.5	50.5	48.4	46.5	40.6	40.9	36.6	29.9	38.0	14.8
04:30 - 04:45	46.2	58.8	51.8	50.9	47.2	43.1	40.8	41.4	37.2	31.4	40.5	14.8
04:45 - 05:00	46.0	57.3	51.4	50.9	47.8	46.2	41.9	41.6	36.9	30.0	36.2	14.7
05:00 - 05:15	46.0	61.4	51.4	49.8	47.4	45.4	40.9	41.8	37.2	33.6	35.7	14.6
05:15 - 05:30	47.0	61.2	52.4	52.4	49.7	46.0	42.4	43.2	37.9	32.0	35.5	14.6
05:30 - 05:45	47.2	63.1	52.0	53.1	50.7	46.4	42.7	43.6	39.2	28.9	25.1	14.6
05:45 - 06:00	47.8	64.4	53.9	53.3	49.9	46.3	43.4	43.6	40.6	33.8	32.1	14.7
06:00 - 06:15	48.7	66.7	53.3	53.6	49.5	45.9	42.4	43.8	41.8	39.4	36.5	15.1
06:15 - 06:30	48.1	65.5	53.0	55.7	51.3	46.6	43.3	44.2	40.6	31.4	30.2	14.8
06:30 - 06:45	49.2	63.0	54.2	55.8	52.0	47.0	44.6	45.7	41.5	32.9	30.2	15.3
06:45 - 07:00	47.8	58.9	53.6	53.5	50.6	46.3	43.2	44.4	39.9	29.5	28.7	14.6

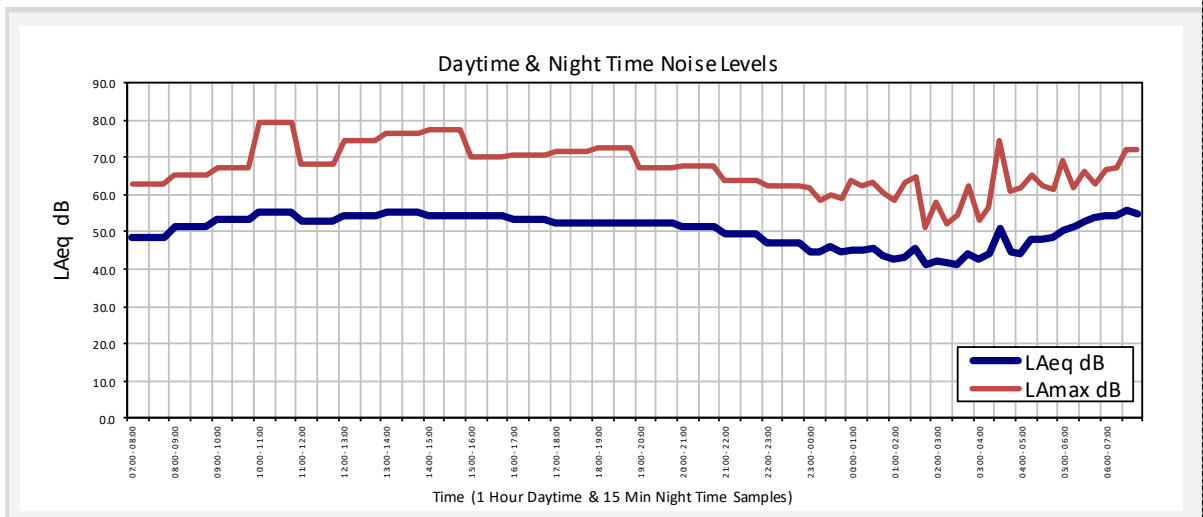


15.6 16th – 17th September 2017 Position 2

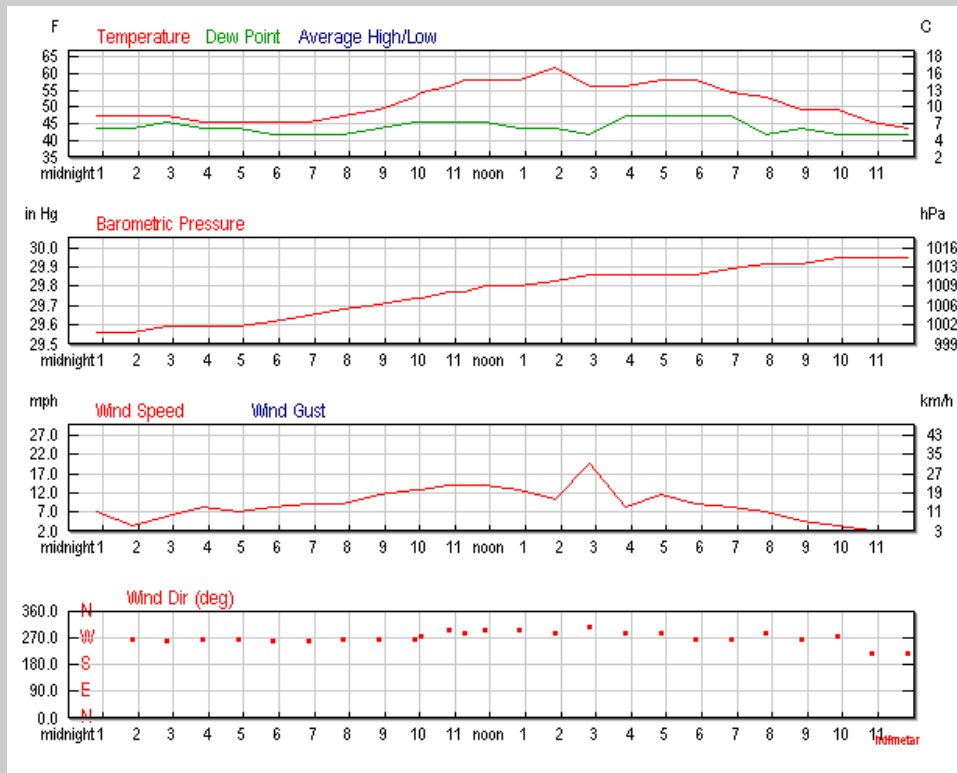
NOISE LEVEL SUMMARY ASSESSMENT		Octave Band Centre Frequency (Hz)										
Date / Time	L _{Aeq}	L _{Amax}	31.5	63	125	250	500	1.0k	2.0k	4.0k	8.0k	16.0k
DAYTIME 07:00 - 23:00 L_{Aeq} 16 HOUR & Cor_r responding L_{Amax} 16 HOUR	52.9	72.6	59.4	58.9	55.2	51.9	48.6	48.8	45.9	35.9	32.5	15.5
NIGHT TIME 23:00 - 07:00 L_{Aeq} 8 HOUR & Cor_r responding L_{Amax} 8 HOUR	49.3	65.5	55.2	55.1	50.6	47.6	44.8	45.6	41.2	33.9	35.2	15.7

DAYTIME NOISE LEVELS 07:00 - 23:00 1 HOUR SAMPLES		Octave Band Centre Frequency (Hz)										
Date / Time	L _{Aeq}	L _{Amax}	31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
07:00 - 08:00	48.6	62.7	54.7	54.3	51.8	48.2	44.8	44.7	40.5	31.0	28.2	14.7
08:00 - 09:00	51.5	65.2	58.1	57.7	54.5	50.9	48.4	47.5	43.2	34.9	31.9	15.2
09:00 - 10:00	53.2	67.3	60.3	59.3	55.5	53.0	50.2	48.9	44.9	35.9	32.3	15.7
10:00 - 11:00	55.4	79.2	59.6	59.3	55.7	53.8	49.6	50.5	50.6	36.9	33.3	15.1
11:00 - 12:00	52.8	68.3	61.4	60.6	56.2	52.4	48.9	48.6	45.1	36.0	33.3	15.3
12:00 - 13:00	54.3	74.2	62.5	61.2	56.3	52.8	49.5	50.3	48.0	36.1	32.2	16.0
13:00 - 14:00	55.1	76.2	61.6	60.6	56.9	52.9	49.7	51.0	49.0	35.7	32.2	15.5
14:00 - 15:00	54.3	77.2	60.3	60.0	56.9	54.6	48.9	49.4	48.5	37.3	33.8	15.7
15:00 - 16:00	54.2	70.0	61.7	60.6	57.8	53.3	50.9	50.4	45.8	36.7	32.6	15.3
16:00 - 17:00	53.3	70.4	59.4	59.4	55.7	52.1	49.3	49.8	45.2	36.0	32.7	15.2
17:00 - 18:00	52.4	71.7	59.1	58.7	55.1	51.6	48.8	48.5	43.5	37.6	36.7	15.3
18:00 - 19:00	52.3	72.7	58.3	59.0	53.1	50.0	48.2	48.3	45.0	38.3	33.6	15.5
19:00 - 20:00	52.4	67.1	57.4	57.5	55.1	53.1	48.5	48.4	43.9	35.7	31.8	15.4
20:00 - 21:00	51.5	67.7	55.4	56.3	53.6	48.5	46.9	48.3	43.6	36.0	30.6	15.1
21:00 - 22:00	49.3	64.0	54.4	55.4	51.3	47.1	44.6	46.0	41.6	32.9	28.4	15.4
22:00 - 23:00	46.8	62.1	53.0	54.7	49.6	47.1	42.6	42.9	38.5	30.5	27.0	17.5

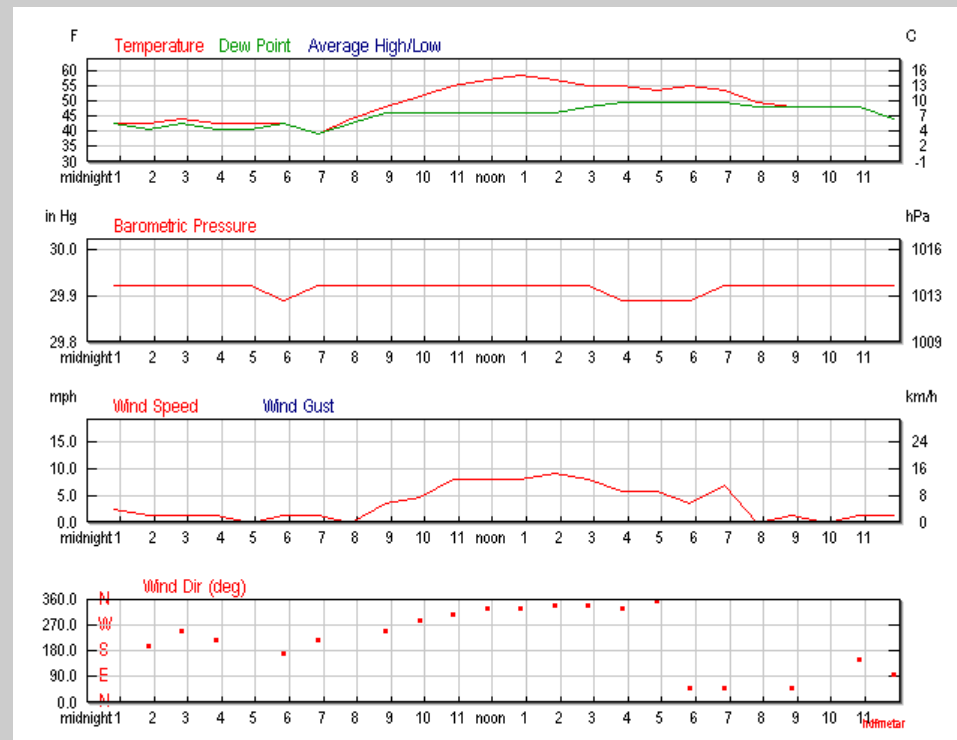
NIGHT TIME NOISE LEVELS 23:00 - 07:00 15 MINUTE SAMPLES		Octave Band Centre Frequency (Hz)										
Date / Time	L _{Aeq}	L _{Amax}	31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
23:00 - 23:15	44.4	61.8	55.4	53.1	47.6	43.4	40.1	40.7	36.4	28.4	26.4	14.9
23:15 - 23:30	44.6	58.3	51.1	51.8	46.6	43.1	40.1	41.4	36.6	26.6	22.8	14.6
23:30 - 23:45	46.0	59.9	51.6	52.8	46.7	45.0	42.0	42.7	37.4	27.1	21.3	14.6
23:45 - 00:00	44.8	59.1	51.4	52.0	47.3	43.3	40.1	41.5	36.5	27.1	22.3	14.6
00:00 - 00:15	44.9	63.6	51.4	52.4	45.7	43.1	40.8	41.7	36.4	27.1	22.7	14.6
00:15 - 00:30	45.1	62.2	49.1	52.7	46.8	44.3	42.0	41.3	36.1	27.1	23.0	14.6
00:30 - 00:45	45.3	63.1	49.9	51.2	46.7	44.3	41.4	41.6	37.3	28.3	24.6	14.7
00:45 - 01:00	43.8	60.2	49.5	50.7	46.6	42.8	39.5	40.4	35.5	25.9	22.1	14.6
01:00 - 01:15	42.6	58.3	48.0	52.0	51.8	43.9	38.2	37.7	32.0	22.4	17.6	14.5
01:15 - 01:30	43.0	63.3	50.4	51.6	45.5	40.6	38.4	39.3	35.4	27.5	24.2	14.7
01:30 - 01:45	45.4	64.7	50.9	53.4	47.1	43.0	40.6	41.2	38.1	32.6	28.2	14.7
01:45 - 02:00	41.3	51.1	46.3	47.8	45.1	40.1	36.8	38.0	32.6	21.6	16.8	14.5
02:00 - 02:15	41.9	58.1	47.6	49.8	44.9	42.1	37.9	38.5	32.3	22.5	17.2	14.6
02:15 - 02:30	41.6	52.2	47.0	46.7	44.8	41.1	37.4	38.3	32.4	21.8	17.1	14.5
02:30 - 02:45	41.4	54.7	47.1	48.3	46.0	42.7	37.6	37.5	31.5	21.3	16.9	14.5
02:45 - 03:00	44.0	62.4	48.9	48.2	46.6	43.0	39.2	40.3	35.8	28.6	27.1	14.6
03:00 - 03:15	42.5	53.0	49.1	48.3	45.2	41.6	38.4	39.4	33.3	22.4	17.4	14.6
03:15 - 03:30	44.3	56.6	45.7	46.6	44.9	41.7	39.0	39.4	33.3	25.1	19.7	14.7
03:30 - 03:45	50.8	74.4	53.4	52.7	50.0	46.3	45.0	45.3	45.3	38.9	40.1	16.4
03:45 - 04:00	44.5	60.9	52.2	50.2	46.1	42.1	39.6	41.1	35.9	26.9	33.7	14.6
04:00 - 04:15	44.3	61.9	50.4	48.5	45.5	42.1	39.9	40.8	35.2	28.9	33.1	14.7
04:15 - 04:30	47.8	65.4	54.6	51.6	47.5	44.6	43.1	44.1	39.8	33.7	36.8	15.1
04:30 - 04:45	47.9	62.5	54.9	52.6	48.8	45.8	43.6	44.2	39.2	34.2	34.9	15.0
04:45 - 05:00	48.5	61.5	55.0	54.5	49.4	47.0	43.9	45.0	40.2	33.4	34.2	14.7
05:00 - 05:15	50.3	69.2	54.5	54.6	50.3	50.1	48.1	46.4	40.8	34.6	32.0	14.8
05:15 - 05:30	51.4	62.0	55.7	55.6	51.8	49.2	46.6	48.5	42.9	35.1	33.5	14.8
05:30 - 05:45	52.8	66.2	57.5	56.7	52.4	50.1	47.8	49.9	44.8	35.0	35.8	14.9
05:45 - 06:00	53.7	62.7	58.8	60.0	54.8	52.4	49.5	50.5	45.0	35.4	38.8	15.2
06:00 - 06:15	54.5	66.5	59.9	60.3	57.0	51.8	49.4	51.3	46.8	36.7	37.5	15.0
06:15 - 06:30	54.1	66.9	60.3	59.7	54.5	52.1	49.4	50.6	46.2	38.3	39.2	15.8
06:30 - 06:45	55.7	72.0	61.8	61.7	57.2	55.0	51.1	51.1	47.7	42.4	44.7	23.6
06:45 - 07:00	55.0	72.1	62.3	61.7	55.8	52.7	51.0	51.2	47.2	40.8	39.6	16.5



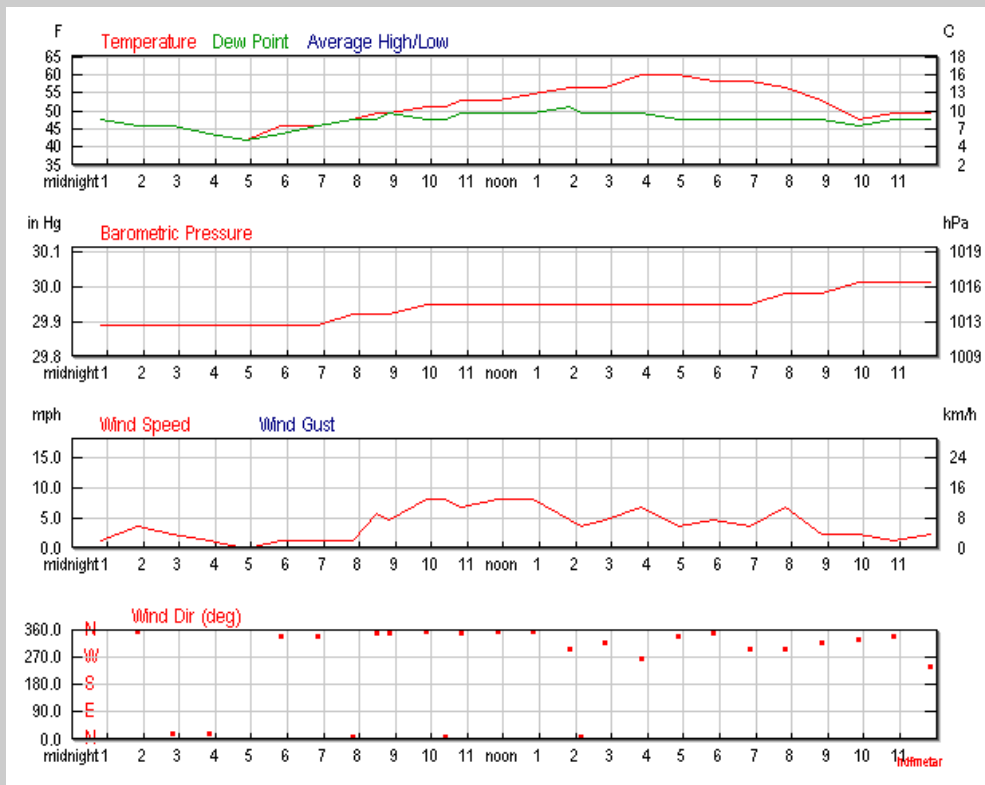
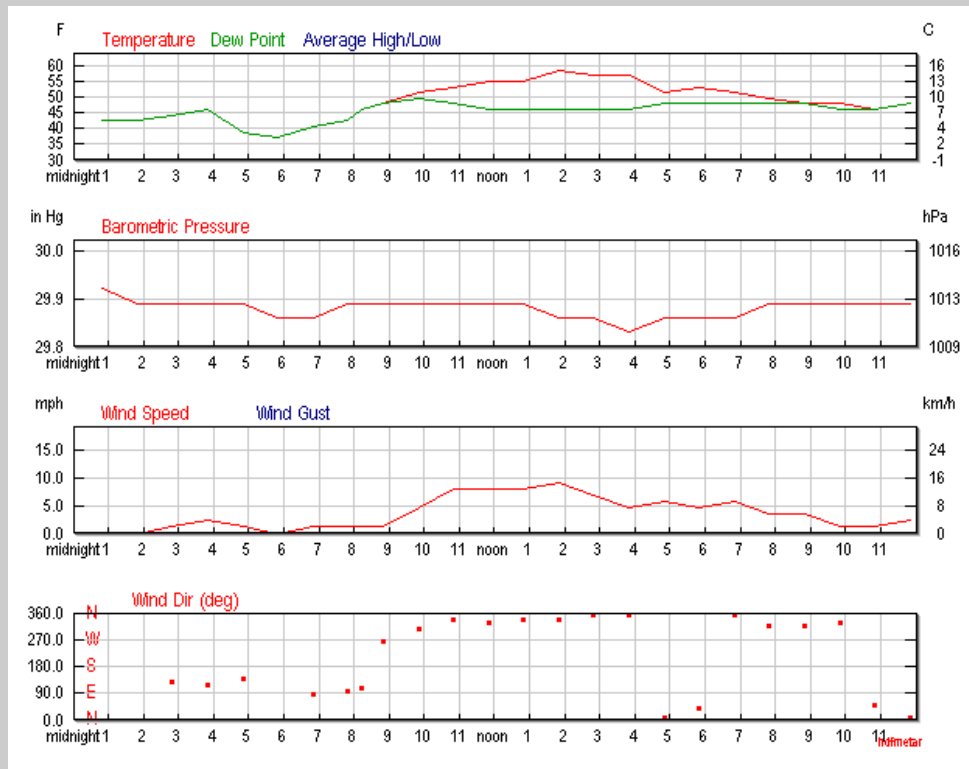
16 ENVIRONMENTAL CONDITIONS



14th September 2017



15th September 2017



#END OF REPORT#