



REPORT REFERENCE:

SA – 4697-3

INDUSTRIAL NOISE IMPACT ASSESSMENT

BS 4142: 2014

CLIENT:

Mr Roly Ruffell

SITE:

Home Farm, 132 Havant Road, Hayling Island, PO11 0UJ

SURVEY DATES:

9th – 12th November 2016

Report Presented By
Mr. B. J. Scrivener MIOA



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1	EXECUTIVE SUMMARY.....	4
1.1	INSTRUCTION	4
1.2	SCOPE OF REPORT.....	4
1.3	SUMMARY OF REPORT	4
1.3.1	<i>Measured Background Noise Levels</i>	<i>4</i>
1.4	OPERATION OF THE SITE.....	5
1.5	ASSESSMENT.....	5
1.5.1	<i>Assessment Position 1 – Nearest affected Residential window</i>	<i>5</i>
1.6	CONCLUSIONS	5
2	INTRODUCTION.....	6
2.1	INSTRUCTION	6
2.2	AMBIENT AND BACKGROUND MEASUREMENTS	6
2.3	BS 4142 : 2014.....	8
2.4	NATIONAL PLANNING POLICY FRAMEWORK & NOISE POLICY STATEMENT FOR ENGLAND 2010.....	9
3	PROCEEDURE	10
3.1	EXTERNAL NOISE.....	10
3.2	MEASUREMENT POSITIONS.....	10
3.3	SAMPLE MEASUREMENTS	10
3.4	MEASUREMENT PROCEDURES.....	10
3.5	DOWNLOADED RESULTS.....	10
4	APPARATUS	11
4.1	EQUIPMENT CALIBRATION	11
4.2	POSITION 1 – REAR OF SITE	11
5	RESULTS.....	12
5.1	07:00 – 23:00 ON 9 TH NOVEMBER 2016.....	12
5.2	07:00 – 23:00 ON 10 TH NOVEMBER 2016	12
5.3	07:00 – 23:00 ON 11 TH NOVEMBER 2016	12
5.4	07:00 – 23:00 ON 12 TH NOVEMBER 2016	12
6	CALCULATIONS.....	13
6.1	EXISTING SOURCE LEVELS	13
6.1.1	<i>07:00 – 23:00 on 9th November 2016.....</i>	<i>13</i>
6.1.2	<i>07:00 – 23:00 on 10th November 2016.....</i>	<i>13</i>
6.1.3	<i>07:00 – 23:00 on 11th November 2016.....</i>	<i>13</i>
6.1.4	<i>3D Model of Existing Noise Sources</i>	<i>14</i>
6.1.5	<i>3D Model of Proposed Location.....</i>	<i>15</i>
7	RECOMMENDATIONS.....	16
7.1	PROPOSED ACOUSTIC SCREEN	17

8	BS4142:2014 NOISE ASSESSMENT	18
8.1	SCOPE OF BRITISH STANDARD 4142:2014	18
8.2	TERMS AND DEFINITIONS	18
8.3	ASSESSMENT POSITION	18
8.4	CALCULATIONS	18
8.5	EQUIVALENT POSITION	18
8.6	RATING LEVELS (CHARACTER CORRECTION)	19
8.7	SUBJECTIVE METHOD	19
8.8	ASSESSMENT CRITERION	20
8.9	NOISE METER FLOOR	20
8.10	OCTAVE BAND FREQUENCY ANALYSIS	20
8.11	BS 4142 : 2014 PENALTIES	20
8.12	BS 4142 : 2014 NOISE ASSESSMENT - DAYTIME	21
8.12.1	<i>Justification of subjective penalty.</i>	21
8.13	ASSESSMENT CONCLUSION	21
9	NPPF & NPSE	22
10	CONCLUSION	23
10.1	OBSERVED EFFECT LEVELS	23
10.2	07:00 – 23:00 ON 9 TH NOVEMBER 2016 BACKGROUND	24
10.3	07:00 – 07:00 ON 10 TH NOVEMBER 2016 BACKGROUND	25
10.4	07:00 – 07:00 ON 11 TH NOVEMBER 2016 BACKGROUND	26
10.5	07:00 – 07:00 ON 12 TH NOVEMBER 2016 BACKGROUND	27
10.6	07:00 – 07:00 ON 9 TH NOVEMBER 2016 SOURCE	28
10.7	07:00 – 07:00 ON 10 TH NOVEMBER 2016 SOURCE	29
10.8	07:00 – 07:00 ON 11 TH NOVEMBER 2016 SOURCE	30
11	ENVIRONMENTAL CONDITIONS	31

1 EXECUTIVE SUMMARY

1.1 Instruction

Sound Advice Acoustics have been instructed by Mr Roly Ruffell to undertake a background noise survey at the existing facility at Home Farm, 132 Havant Road, Hayling Island, to understand the level of impact at the existing operations will have if they are moved to the proposed location towards the rear of the site. This additional noise report relates to the proposal to increase the operational space and therefore the council have requested an updated noise report to reflect these proposed changes. It should be noted that the client has already proposed the continuation and installation of an acoustic screen to mimic that of the existing, but to cover the newly proposed extended areas of operation.

A proposal has been made for the relocation of the existing scaffolding storage yard from its current location to a new proposed location further away from the existing residential premises. In addition, assessments and calculations are to be made in accordance with BS 4142 : 2014 in order to ensure the proposed location does not have a detrimental acoustic effect on local residents and the nearest noise sensitive receptors.

1.2 Scope of Report

The measurements are undertaken in line with ISO 1996 – Part 2:2007 and the methodology defined within British Standard within British Standard 4142:2014.

This report aims to establish the following:

- ✓ Existing background noise levels at the existing and proposed residential façades (L_{A90});
- ✓ Noise levels from the Proposed Location (L_{Aeq});
- ✓ Impact on the nearest noise sensitive property.
- ✓ Mitigation Levels if Required.

1.3 Summary of Report

1.3.1 Measured Background Noise Levels

Continuous background noise measurements were undertaken between 9th – 12th November 2016 at the Assessment Position 1 as detailed within this report. The modal 1-hour day time background noise levels between 07:00 and 20:00 was found to be $L_{A90,1\text{ hour}}$ 36dB at the assessment position

Assessment Position	LA90 (Modal)
	Day
	(0700 - 2000)
1	36 dB

1.4 Operation of the Site

On the longest day the site is likely to be operational between 7:00am – 8:00pm. Therefore, no night time assessment has been undertaken.

1.5 Assessment

1.5.1 Assessment Position 1 – Nearest affected Residential window.

British Standard 4142:2014	Day Time 07:00 - 20:00
Rating Noise Levels	36
Background Noise Levels	36
Assessment	+/- 0dB below "Low Adverse Impact"

1.6 Conclusions

These calculations and recommendation demonstrate compliance with BS 4142 and as per our previous assessment provided a 3.5m acoustic screen is installed as detailed within this noise report.

The operation of the existing scaffolding position have been calculated within the proposed location and the noise levels assessed to establish if these will have a demonstrable adverse effect in terms of noise that outweigh the benefits of the development. Measurements have been undertaken in accordance with British Standard 4142:2014 and ISO 1996 – Part 2: 2007. This report aims to establish: the existing background noise levels at the closest residential façade to the site and the assessment of the impact of the site operation on nearby commercial properties. The resulting emissions from the site running on a worst case scenario show no conflict with 'low adverse impact' criteria and gives a strong indication that complaint and impact on the local amenity is unlikely, provided the recommendation detailed within this report are undertaken.

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 2018, NPPF & NPSE and that, with regards to sound, planning permission can be granted.

2 INTRODUCTION

2.1 Instruction

Sound Advice Acoustics have been instructed by Mr Roly Ruffell to undertake a background noise survey at the existing facility at Home Farm, 132 Havant Road, Hayling Island, to understand the level of impact at the existing operations will have if they are moved to the proposed location towards the rear of the site.

The purpose of this assessment is to ensure the acoustic protection of noise sensitive premises closest to the proposed operational location which is further away from the existing residential than the existing operations. Noise sensitive premises are not restricted to residential dwellings as offices can be affected by unwanted external noise. However, the residential properties to the West and North West have been identified as the nearest noise sensitive and therefore all calculations and assessments are to be made to this position.

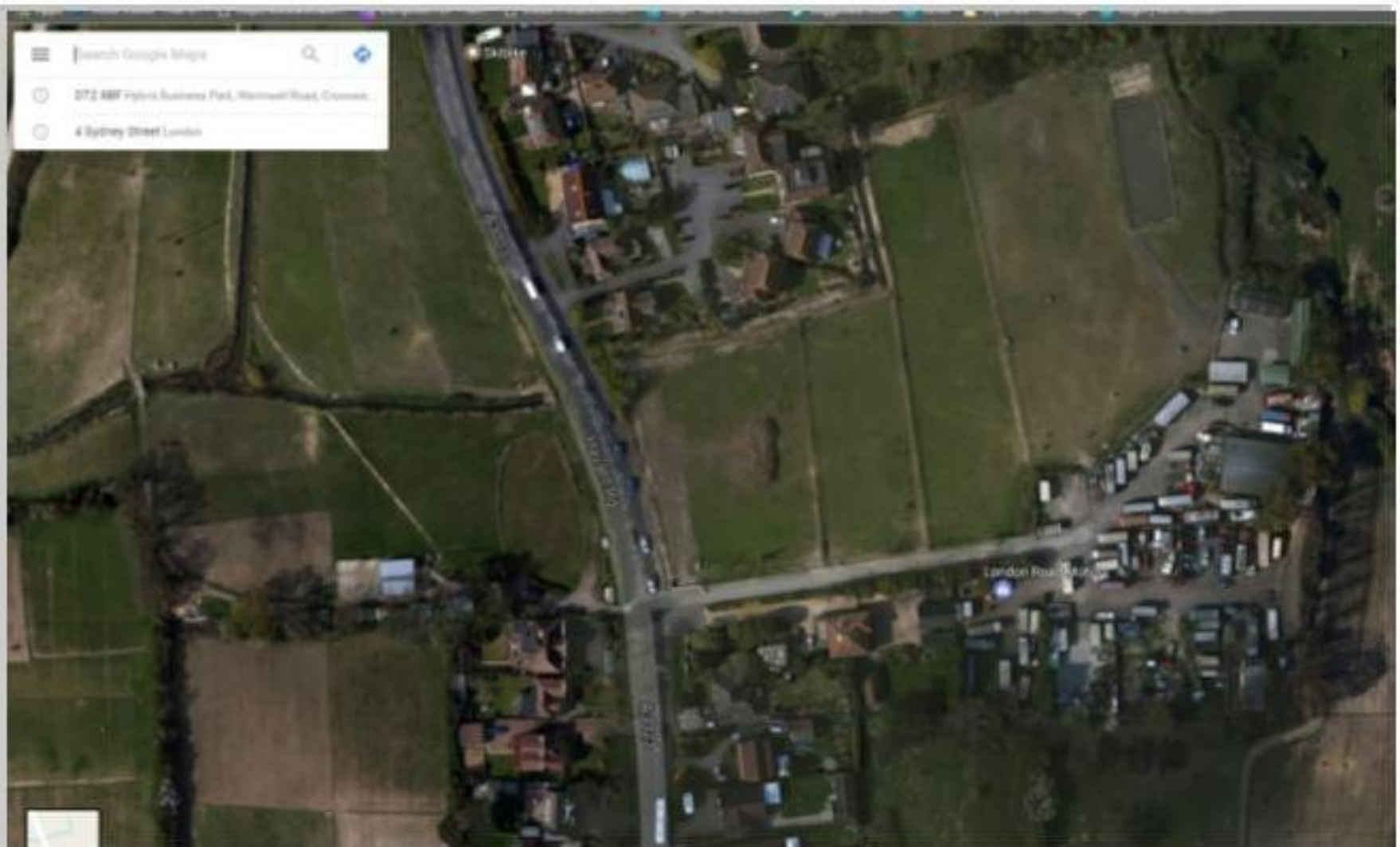
2.2 Ambient and Background Measurements

Therefore, this external noise assessment has been carried out in order to identify the background noise level at the nearest affected noise sensitive premises which is understood to be the rear of the residential properties facing onto Havant Road.

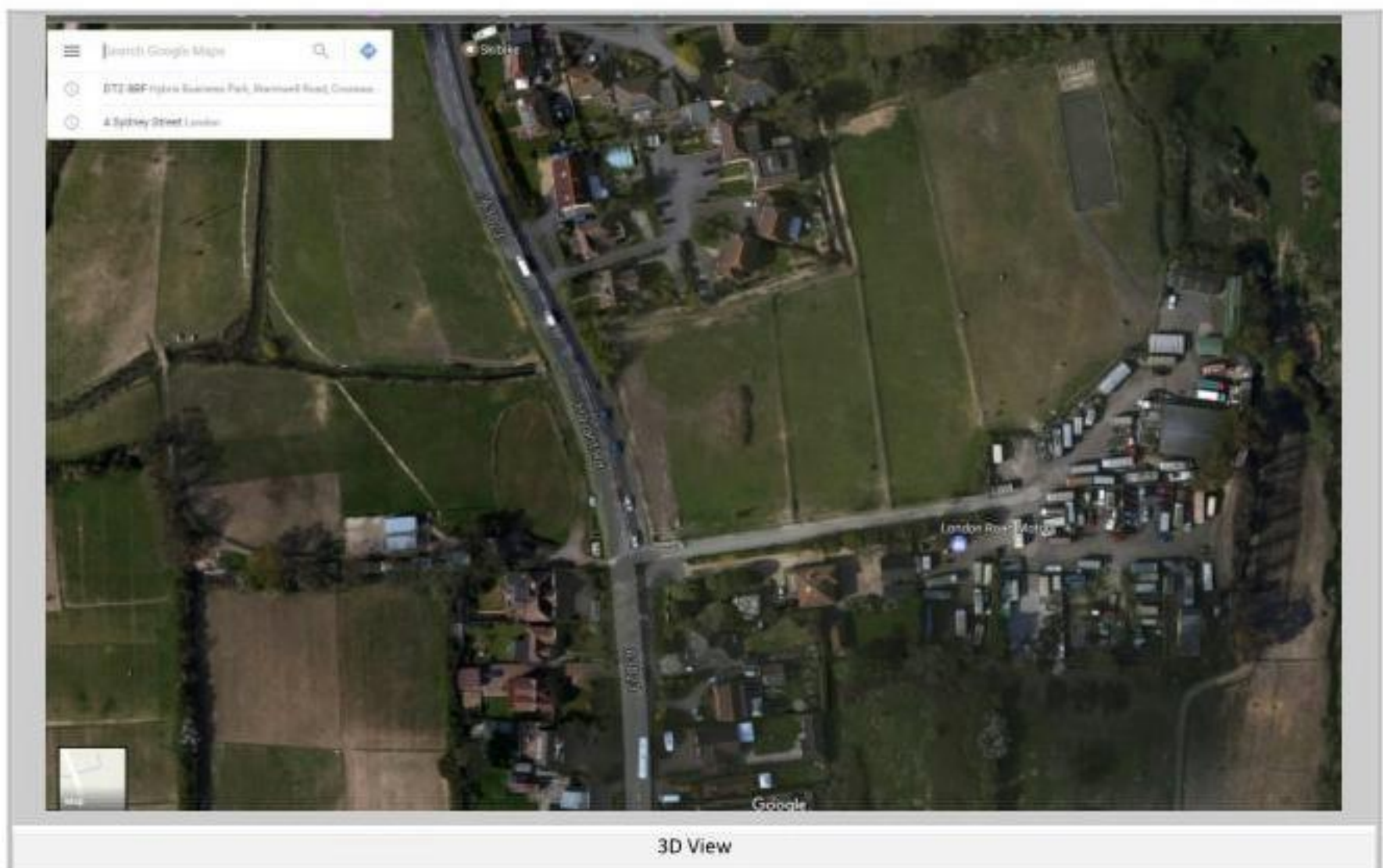
External noise levels are to be recorded over, what has been considered for the site, an average / typical time period in order to assess the daytime and night time noise levels. Levels have been recorded over more than one day in order to ensure the uncertainty of measurement aspects of BS 4142 : 2014 have been satisfied and that the data recorded is representative for the purpose of a robust assessment.



Existing and Proposed Scaffolding Positions



View of Site



2.3 BS 4142 : 2014

British Standard 4142 : 2014 is to be adopted for the basis of this background noise level assessment. A BS 4142 : 2014 noise assessment will be carried out in order to demonstrate the existing acoustic impact the external plant currently has on the nearest affected residential and make suitable recommendations in order to demonstrate that these units 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).

2.4 National Planning Policy Framework & Noise Policy Statement for England 2010

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.

“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:

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.*

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.

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.

3 PROCEEDURE

3.1 External noise

External noise levels were recorded over a typical weekend and weekday period including 9th – 12th November 2016 at position 1 as detailed on the attached plan sketch layout.

3.2 Measurement Positions

Position 1 was located at the rear of the site in order to capture the background noise levels associated with the residential properties facing onto the proposed location. This is a representative position for the prevailing background noise level.

3.3 Sample measurements

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	
L _{Aeq} 1 HOUR dB	L _{A10} 1 HOUR dB
L _{AMAX} 1 HOUR dB	L _{A50} 1 HOUR dB
L _{AMIN} 1 HOUR dB	L _{A90} 1 HOUR dB

3.4 Measurement procedures

Measurement procedures are to be adopted from BS 4142 : 2014 and the representative background noise level for the assessment location determined over the period of interest. Determination of background noise levels for daytime and night time analysis has been carried out in accordance with section 8 of BS 4142 : 2014.

3.5 Downloaded Results

From the downloaded recorded results the daytime was assessed and used within the above calculations as

L_{Aeq} 1 HOUR dB

4 APPARATUS

4.1 Equipment Calibration

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 0.2 dB.

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.

4.2 Position 1 – Rear of Site

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

The noise meter was calibrated before and after the assessment period and found to be within the tolerance of the manufacturer's guidance. Full Calibration certificates are available upon request.

5 RESULTS

5.1 07:00 – 23:00 on 9th November 2016

Date / Time	LAeq	LA90	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 MODE 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	57.0	45.0	58.0	56.0	52.0	49.0	51.0	56.0	43.0	40.0	35.0	30.0

5.2 07:00 – 23:00 on 10th November 2016

Date / Time	LAeq	LA90	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 MODE 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	56.0	36.0	58.0	58.0	51.0	42.0	47.0	54.0	50.0	37.0	34.0	10.0

5.3 07:00 – 23:00 on 11th November 2016

Date / Time	LAeq	LA90	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 MODE 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	47.0	41.0	53.0	56.0	55.0	50.0	42.0	36.0	39.0	30.0	35.0	29.0

5.4 07:00 – 23:00 on 12th November 2016

Date / Time	LAeq	LA90	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 MODE 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	45.0	39.0	60.0	55.0	52.0	47.0	41.0	37.0	32.0	34.0	32.0	27.0

6 CALCULATIONS

6.1 Existing Source Levels

The following existing noise source levels have been recorded at the existing scaffolding storage yard position in order to establish the operational noise levels of this area, which are then to be moved to the proposed location where further calculations and assessments are to be carried out.

6.1.1 07:00 – 23:00 on 9th November 2016

Date / Time	LAeq	LAmaz	Octave Band Centre Frequency (Hz)								8.0 k	16.0 k
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k		
DAYTIME MODE 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	71.8	96.6	76.0	73.4	67.8	65.1	64.3	66.0	64.9	63.6	63.8	58.4

6.1.2 07:00 – 23:00 on 10th November 2016

Date / Time	LAeq	LAmaz	Octave Band Centre Frequency (Hz)								8.0 k	16.0 k
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k		
DAYTIME MODE 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	71.6	97.8	71.7	71.8	67.0	65.8	64.9	66.6	64.9	62.8	61.5	56.0

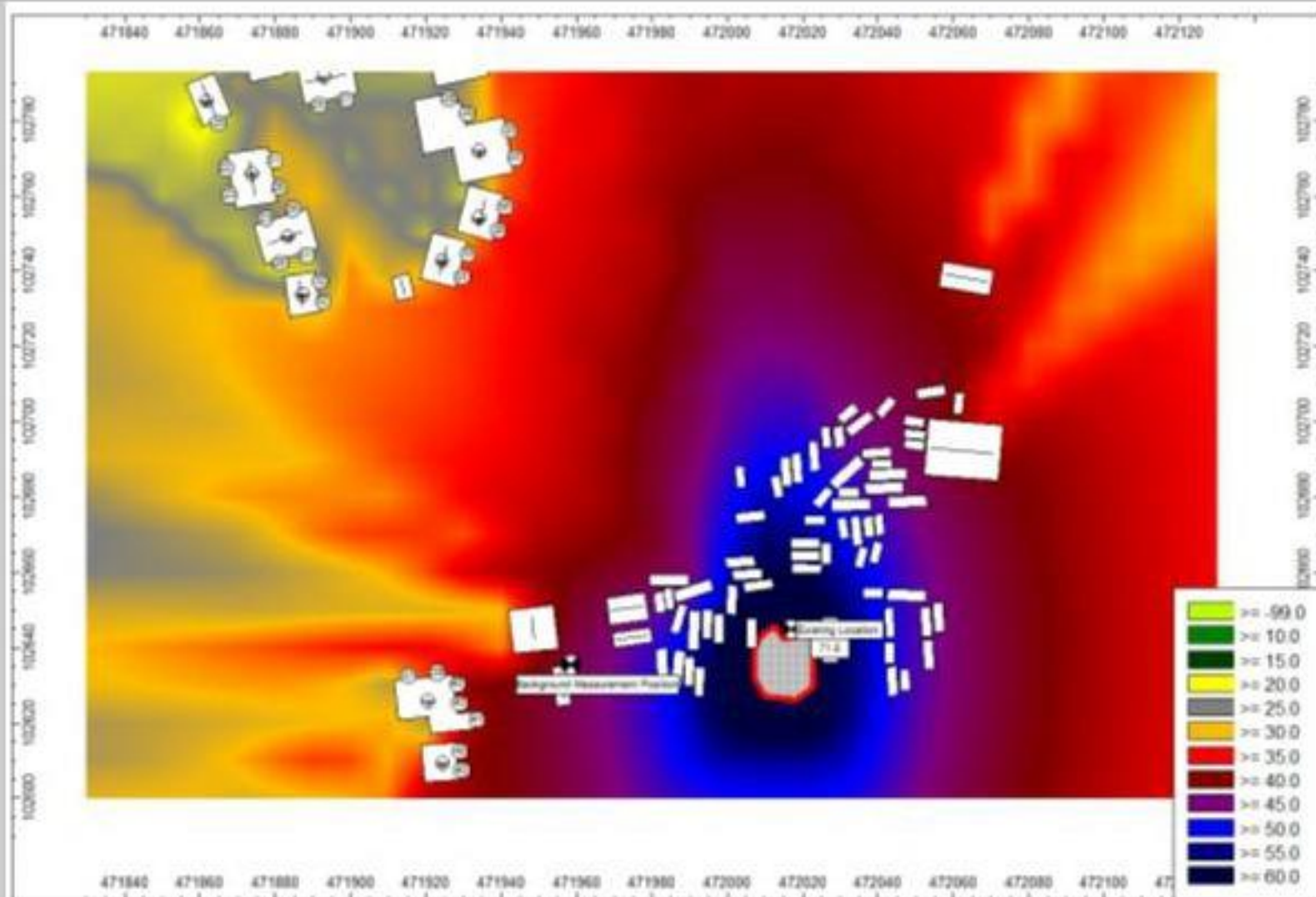
6.1.3 07:00 – 23:00 on 11th November 2016

Date / Time	LAeq	LAmaz	Octave Band Centre Frequency (Hz)								8.0 k	16.0 k
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k		
DAYTIME MODE 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	50.6	68.5	62.5	57.6	48.0	46.2	44.5	46.8	44.2	38.4	35.6	30.4

6.1.4 3D Model of Existing Noise Sources



3D Model of Existing Site & Operations

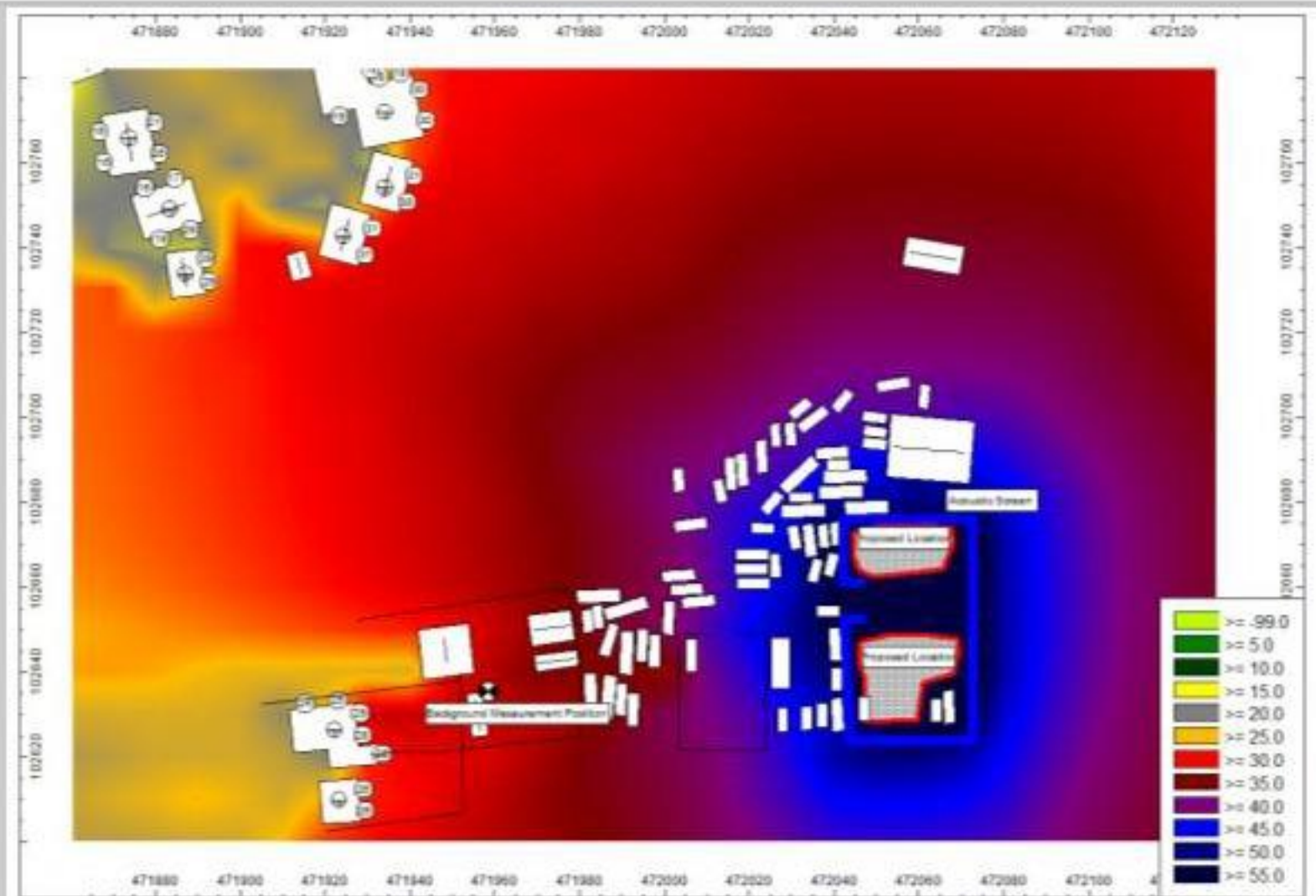


3D Model of Existing Site & Operations Contours

6.1.5 3D Model of Proposed Location



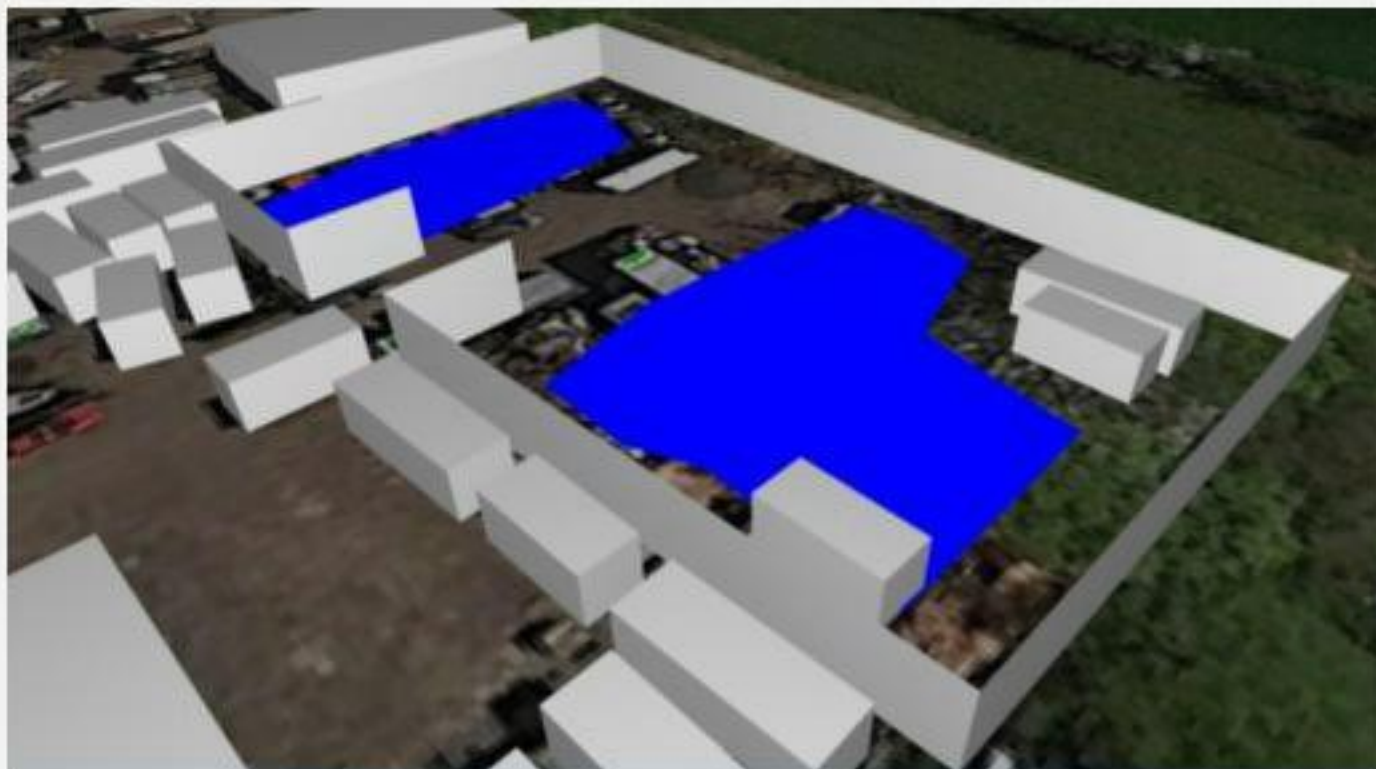
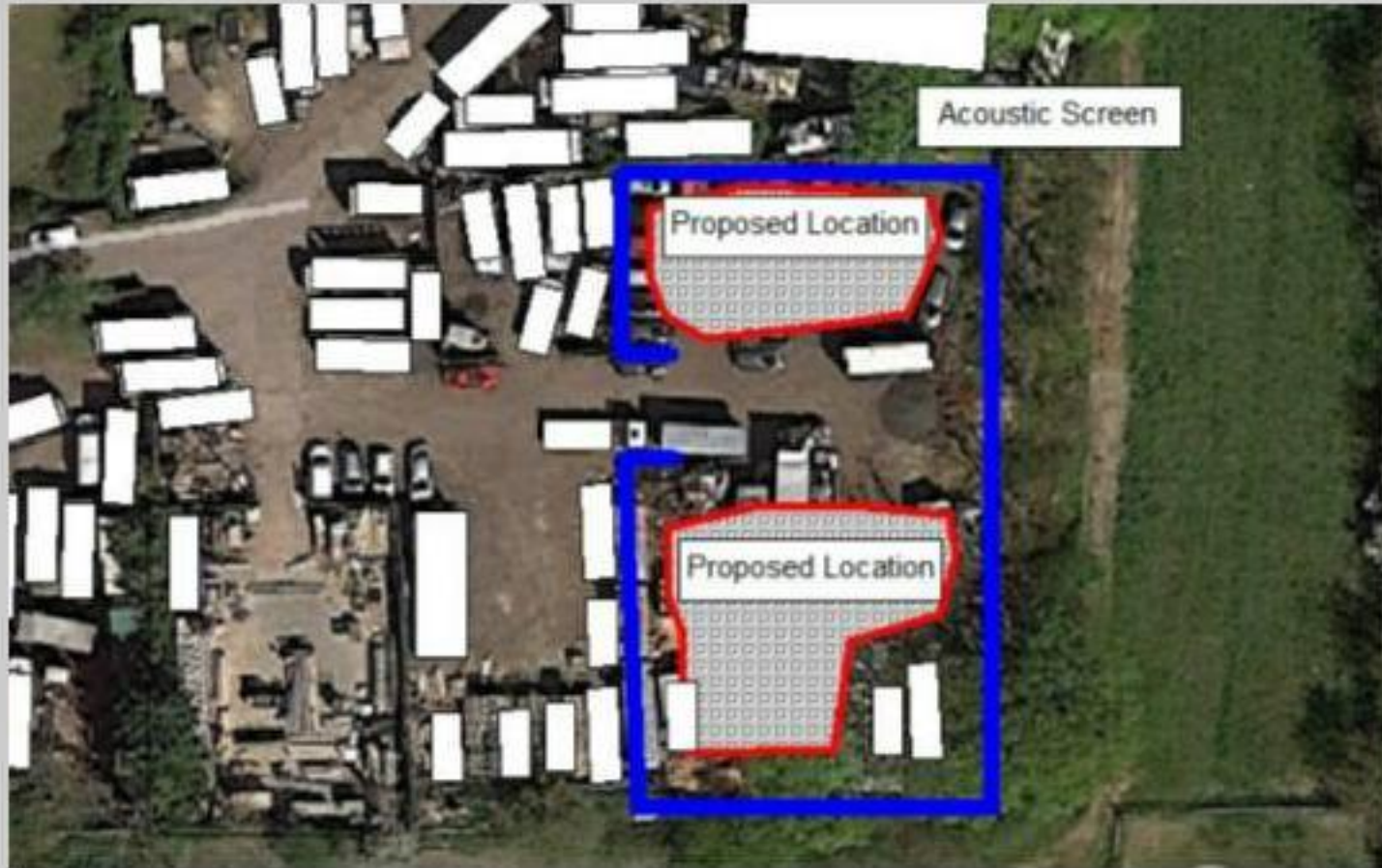
3D Model of Proposed Location & Operations



3D Model of Proposed Location & Operations Contours

7 RECOMMENDATIONS

In order to achieve the required level to ensure compliance with BS 4142 : 2014 and ensure an assessment conclusion of 'Low Adverse Impact' with regards to noise, it is recommended that the proposed location for the new scaffolding storage yard be enclosed within a 3.5m high acoustic fence. This fence or screen should be solid in construction, continuous with no gaps, sealed to the ground, have a minimum surface density of 13 kg/m^3 and be laid out generally as detailed below:-



PROPOSED ACOUSTIC FENCE / SCREEN LOCATION

7.1 Proposed Acoustic Screen



8 BS4142:2014 NOISE ASSESSMENT

8.1 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.

8.2 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.
$L_{A,T}$	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.

8.3 Assessment Position

The assessment position was established as the residential properties facing out onto Havant Road of which the rear of these properties face onto the existing operations of the yards.

8.4 Calculations

The specific noise levels are calculated at the assessment position located at the residential properties around the site using the calculations detailed within ISO 9613 Part 1 and 2: 1996. These calculations take the 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 positions.

8.5 Equivalent Position

The background noise levels were measured at the equivalent position, chosen as it most represented the closest noise sensitive façade, located within the existing yard area between 9th – 12th November 2016.

8.6 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

8.7 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

8.8 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

8.9 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.

8.10 Octave Band Frequency Analysis

All calculations carried out are done so on an octave band centre frequency basis and not an overall dB(A) level. This ensures that the tonal element from any proposed plant is minimised. A large majority of manufacturer's data is supplied in the octave band centre frequency (Hz) format.

8.11 BS 4142 : 2014 Penalties

Whilst BS 4142 : 2014 allows receptor assessments to 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.

8.12 BS 4142 : 2014 Noise Assessment - Daytime

Results	Daytime Discharge (07:00 – 20:00)
Background Sound Level	LA90 = 36 dB
Specific Sound	LAeq = 31 dB
Acoustic Feature Correction +2 dB Tonality +3 dB Intermittency	+5 dB
Rating Level	LAeq = 36 dB
Background Sound Level	LA90 = 36 dB
Excess of Rating Over Background Sound Level	+/- 0dB
Assessment Indicates	Low Adverse Impact

8.12.1 Justification of subjective penalty.

The +3dB for intermittency characteristic and +2dB for Tonality has been added for assessment of the existing operations.

8.13 Assessment Conclusion

It can be seen from the above assessments that the proposed location has returned an assessment conclusion of Low Adverse Impact provided the specified 3.5m acoustic screen is installed.

9 NPPF & NPSE

The National Planning Policy Framework 2018 (NPPF) and assessments to the Noise Policy Statement for England 2010 (NPSE) should be made in conjunction with each other. Paragraphs 180 - 183 of the National Planning Policy Framework 2018 (NPPF) states the following:

Para 180 Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- a) Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life.
- b) Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.
- c)

Para 181 Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications.

Para 182 Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.

Para 183 The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities

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 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.

10 CONCLUSION

Sound Advice Acoustics have been instructed by Mr Roly Ruffell to undertake a background noise survey at the existing facility at Home Farm, 132 Havant Road, Hayling Island, to understand the level of impact at the existing operations will have if they are moved to the proposed location towards the rear of the site. This additional noise report relates to the proposal to increase the operational space and therefore the council have requested an updated noise report to reflect these proposed changes. It should be noted that the client has already proposed the continuation and installation of an acoustic screen to mimic that of the existing, but to cover the newly proposed extended areas of operation.

10.1 Observed Effect Levels

This detailed report and evaluated design, developed for the proposed site, will ensure that the proposed storage yard positioning will be compliant with BS 4142 : 2014. Therefore, the development can be implemented within the guidelines of the aforementioned documents and ensure a 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.

National Planning Policy Framework 2018 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.

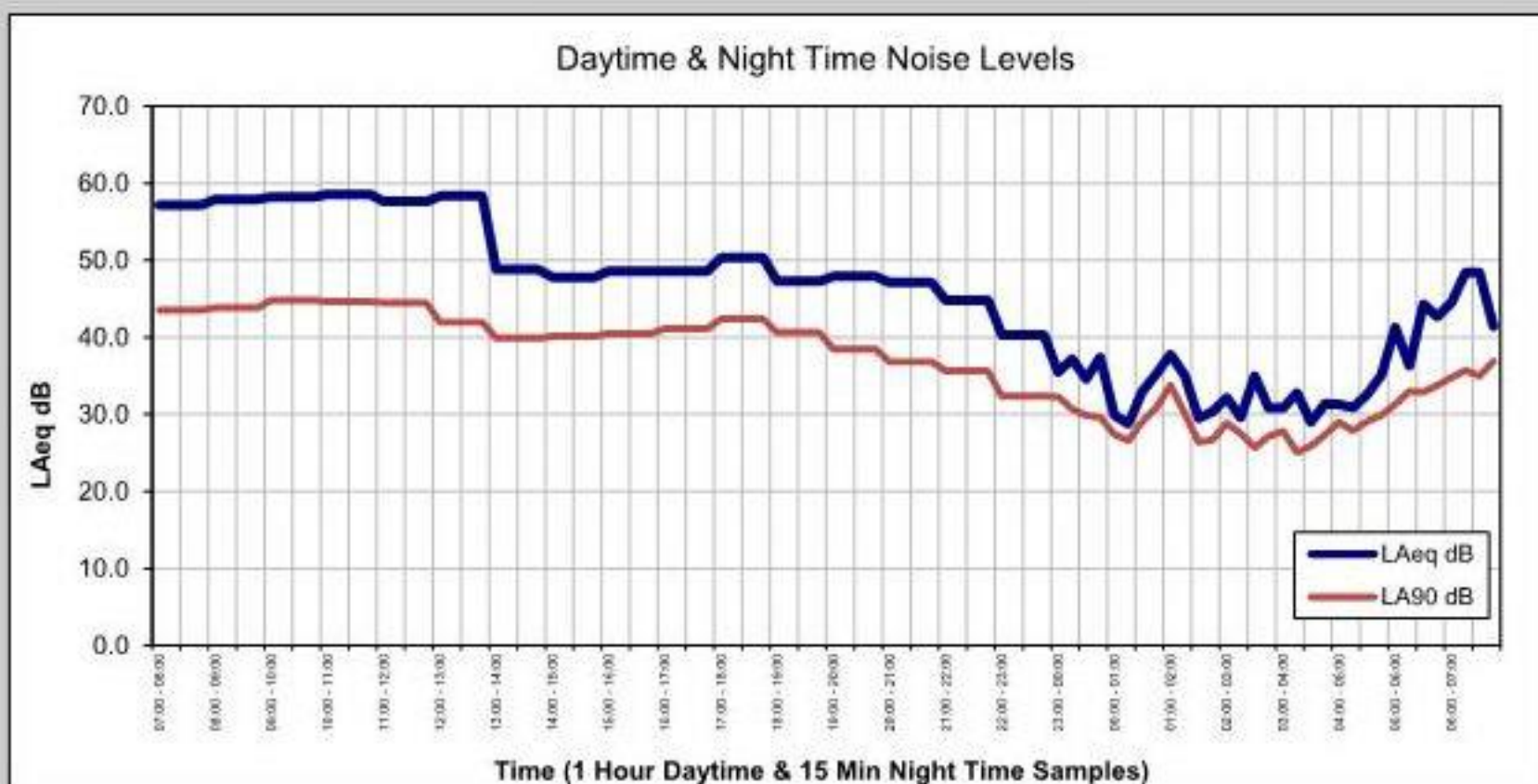
Based on the calculations and assessments made within this report it is the professional opinion of Sound Advice Acoustics Ltd that the proposed development can demonstrate compliance with the National Planning Policy Framework 2018, NPPF & NPSE and that, with regards to sound, planning permission can be granted.



PLAN SKETCH LAYOUT

10.2 07:00 – 23:00 on 9th November 2016 Background

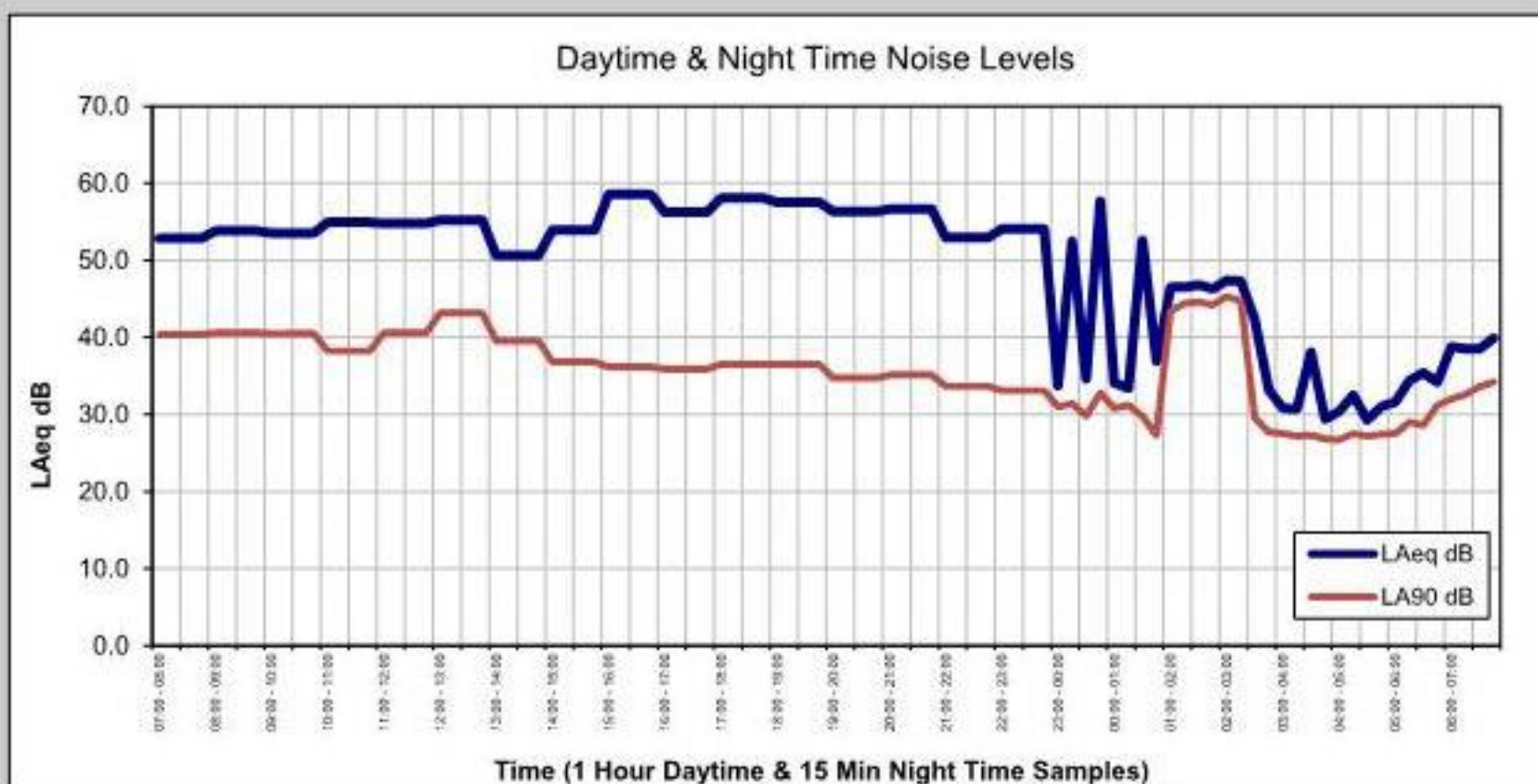
Date / Time	LAeq	LA90	Octave Band Centre Frequency (Hz)									
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
DAYTIME MODE 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	57.0	45.0	58.0	56.0	52.0	49.0	51.0	56.0	43.0	40.0	35.0	30.0



DAYTIME NOISE LEVELS 07:00 - 23:00												
Date / Time	LAeq	LA90	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	57.2	43.5	59.8	57.1	57.7	49.1	51.4	54.6	49.8	38.7	29.7	21.8
08:00 - 09:00	57.9	43.8	62.3	59.3	52.2	48.7	50.6	55.6	51.1	39.5	35.5	25.6
09:00 - 10:00	58.2	44.8	66.7	60.7	54.9	51.2	50.7	55.8	51.6	40.4	34.5	29.6
10:00 - 11:00	58.6	44.6	66.9	60.6	55.0	51.8	51.1	56.0	52.1	40.6	34.7	29.6
11:00 - 12:00	57.6	44.5	67.5	60.7	54.6	51.9	50.4	54.5	51.8	40.4	35.2	30.8
12:00 - 13:00	58.3	42.0	68.7	62.9	57.3	56.8	55.5	54.5	50.1	39.6	34.4	30.0
13:00 - 14:00	48.8	39.9	60.1	56.2	51.9	48.5	42.6	43.0	43.2	36.2	32.0	26.2
14:00 - 15:00	47.8	40.1	62.3	56.3	51.0	48.6	41.4	42.1	41.1	36.7	33.5	28.9
15:00 - 16:00	48.6	40.5	57.5	55.9	48.5	40.7	41.8	44.8	43.4	32.0	21.5	14.6
16:00 - 17:00	48.6	41.1	57.2	55.7	48.7	42.0	43.7	45.3	41.8	32.8	25.6	19.7
17:00 - 18:00	50.3	42.4	64.0	60.1	52.5	48.0	46.8	46.4	42.9	30.7	18.4	13.0
18:00 - 19:00	47.3	40.6	56.6	55.3	50.3	43.4	40.6	43.3	41.6	30.5	19.9	14.3
19:00 - 20:00	47.9	38.5	58.4	53.5	48.2	42.1	40.7	43.9	42.8	32.4	25.8	20.4
20:00 - 21:00	47.1	36.8	58.3	52.4	47.2	42.1	39.9	43.0	42.1	31.7	25.7	20.4
21:00 - 22:00	44.8	35.7	59.0	52.2	49.8	43.9	38.8	40.0	38.8	30.3	26.3	21.1
22:00 - 23:00	40.3	32.4	50.9	47.3	43.2	39.3	35.8	36.2	33.2	23.3	18.3	13.5

10.3 07:00 – 07:00 on 10th November 2016 Background

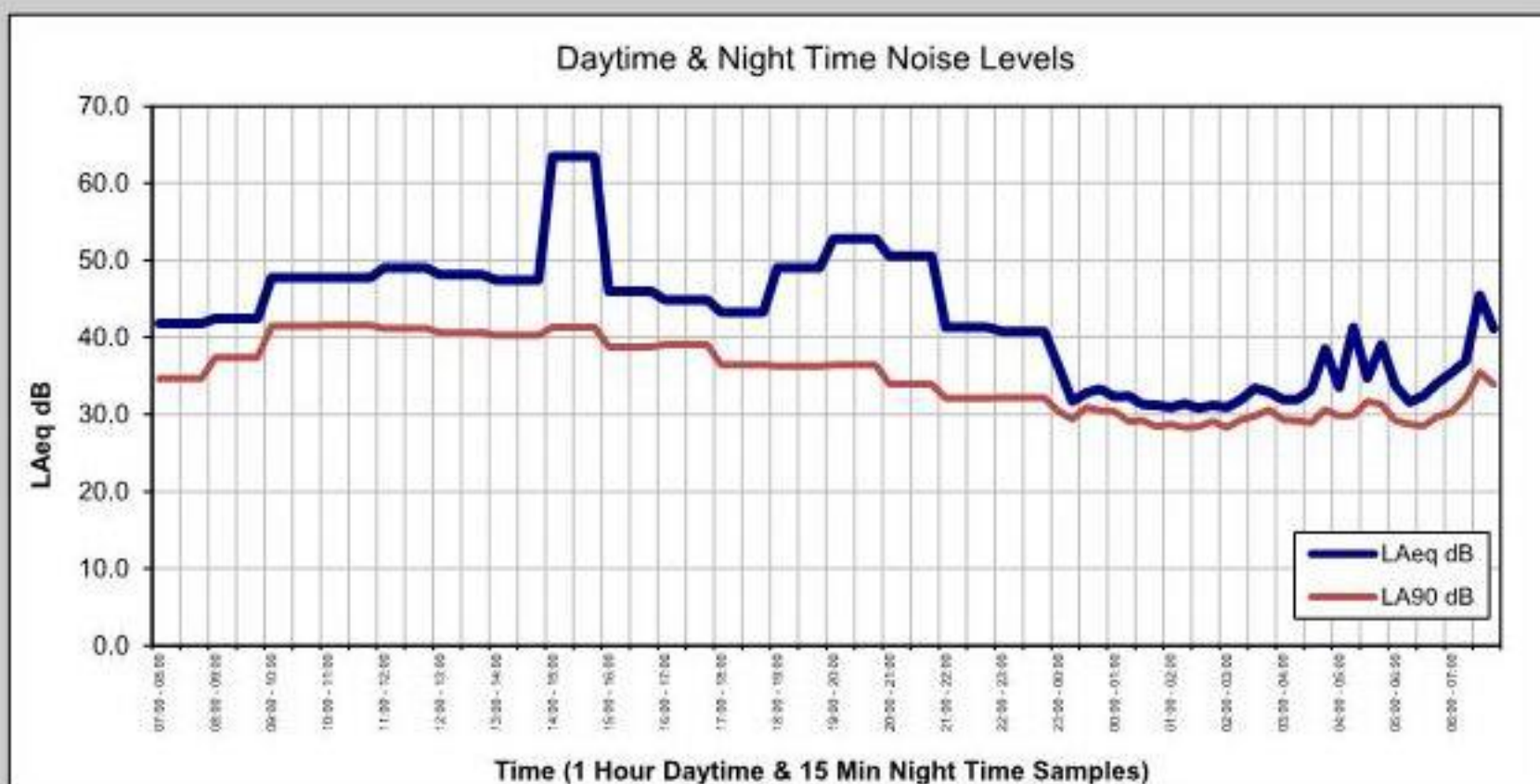
Date / Time	LAeq	LA90	Octave Band Centre Frequency (Hz)									
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
DAYTIME MODE 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	56.0	36.0	58.0	58.0	51.0	42.0	47.0	54.0	50.0	37.0	34.0	10.0



DAYTIME NOISE LEVELS 07:00 - 23:00												
Date / Time	LAeq	LA90	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	52.8	40.3	58.4	57.9	51.3	42.3	43.9	48.9	48.1	37.0	30.5	19.7
08:00 - 09:00	53.8	40.6	57.9	58.0	50.9	43.2	44.9	49.1	49.7	39.3	34.1	21.3
09:00 - 10:00	53.5	40.5	58.6	57.6	53.2	48.1	47.3	48.2	48.9	39.6	34.0	23.4
10:00 - 11:00	54.9	38.2	58.2	56.6	52.7	46.4	46.6	50.1	50.8	40.0	32.7	24.2
11:00 - 12:00	54.8	40.6	57.2	60.1	50.9	45.1	44.2	49.1	51.2	41.7	35.6	27.4
12:00 - 13:00	55.2	43.1	58.7	58.1	52.4	48.4	46.2	49.8	51.1	42.1	39.0	30.1
13:00 - 14:00	50.6	39.5	58.2	56.7	52.7	48.6	44.0	44.7	46.0	36.8	29.4	22.1
14:00 - 15:00	53.9	36.8	58.7	59.6	53.4	46.7	44.3	48.2	50.2	41.3	29.1	13.5
15:00 - 16:00	58.5	36.2	60.6	58.7	54.9	48.8	51.2	53.9	54.3	41.3	27.2	19.4
16:00 - 17:00	56.2	35.9	57.8	54.9	50.2	42.3	47.2	54.0	49.9	38.0	23.9	11.4
17:00 - 18:00	58.1	36.5	57.3	54.8	51.6	42.2	46.8	54.8	53.5	39.5	21.9	13.7
18:00 - 19:00	57.5	36.5	55.2	53.3	51.5	41.8	49.2	53.7	53.1	38.5	20.2	10.3
19:00 - 20:00	56.3	34.7	55.5	53.9	51.1	43.8	48.8	53.8	50.1	37.4	18.7	9.8
20:00 - 21:00	56.6	35.1	58.2	58.4	54.1	50.9	51.9	53.8	49.3	36.5	18.1	10.4
21:00 - 22:00	52.9	33.7	52.5	50.3	50.4	39.6	46.8	50.3	46.2	34.6	15.9	9.5
22:00 - 23:00	54.1	33.1	53.2	50.6	49.5	41.1	46.2	51.2	48.5	35.1	16.4	9.7

10.4 07:00 – 07:00 on 11th November 2016 Background

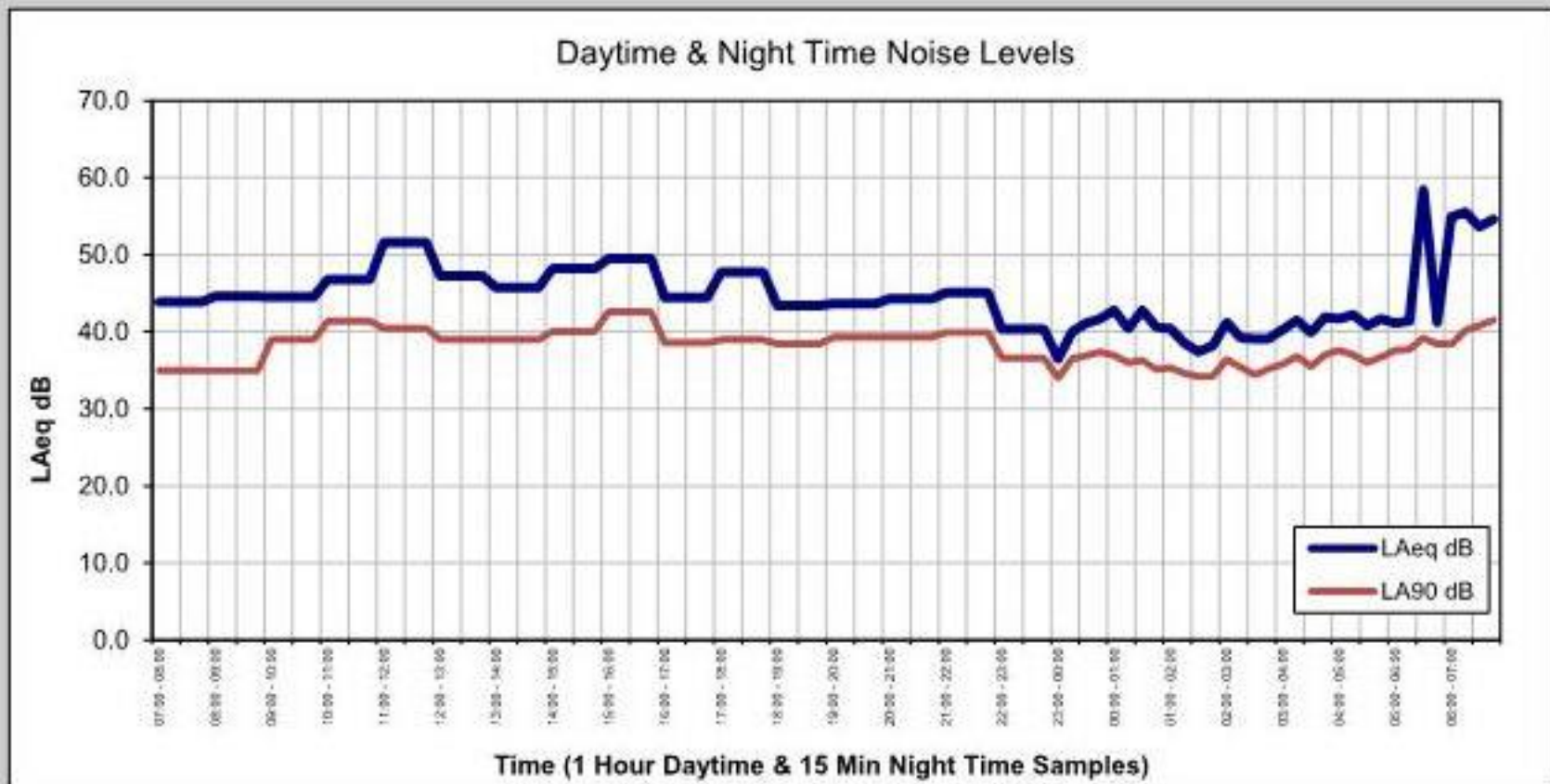
Date / Time	LAeq	LA90	Octave Band Centre Frequency (Hz)									
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
DAYTIME MODE 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	47.0	41.0	53.0	56.0	55.0	50.0	42.0	36.0	39.0	30.0	35.0	29.0



DAYTIME NOISE LEVELS 07:00 - 23:00												
Date / Time	LAeq	LA90	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	41.8	34.6	48.7	47.4	44.0	41.4	34.9	35.9	36.2	29.6	28.3	16.5
08:00 - 09:00	42.4	37.4	53.2	50.6	45.9	42.5	36.4	35.7	34.4	32.6	34.9	22.1
09:00 - 10:00	47.8	41.4	62.4	55.9	55.4	50.3	41.4	40.9	39.1	37.1	35.3	28.9
10:00 - 11:00	47.7	41.6	63.2	56.4	53.1	51.2	42.5	40.2	38.5	37.2	35.0	29.4
11:00 - 12:00	49.0	41.1	62.5	56.7	55.1	52.7	45.5	41.3	39.2	35.5	34.4	28.9
12:00 - 13:00	48.1	40.6	62.3	56.7	54.8	52.2	44.4	40.6	36.4	35.2	34.1	29.0
13:00 - 14:00	47.4	40.3	62.4	55.0	52.4	51.1	41.6	39.6	39.6	36.1	34.7	29.4
14:00 - 15:00	63.4	41.3	65.2	57.6	52.2	50.5	45.3	58.7	59.7	48.1	39.0	32.5
15:00 - 16:00	46.0	38.8	61.0	53.6	50.5	48.9	42.2	39.8	35.8	33.9	32.6	28.1
16:00 - 17:00	44.9	39.1	58.2	52.5	50.1	48.1	42.7	37.6	33.3	32.6	30.9	26.1
17:00 - 18:00	43.2	36.5	51.8	49.7	49.0	44.7	41.3	38.4	30.8	26.6	24.3	19.3
18:00 - 19:00	49.0	36.3	54.0	49.8	45.8	47.3	49.4	43.7	35.2	29.6	27.6	22.8
19:00 - 20:00	52.8	36.4	52.7	51.5	51.2	52.1	52.6	48.0	39.1	28.8	25.9	21.0
20:00 - 21:00	50.5	33.9	52.1	48.7	44.9	49.2	52.0	43.9	33.9	21.3	16.1	12.2
21:00 - 22:00	41.3	32.1	47.6	44.6	37.5	40.4	42.0	36.1	25.9	18.2	16.0	11.8
22:00 - 23:00	40.8	32.2	53.3	48.2	40.3	43.9	40.5	33.5	27.1	17.4	13.6	10.5

10.5 07:00 – 07:00 on 12th November 2016 Background

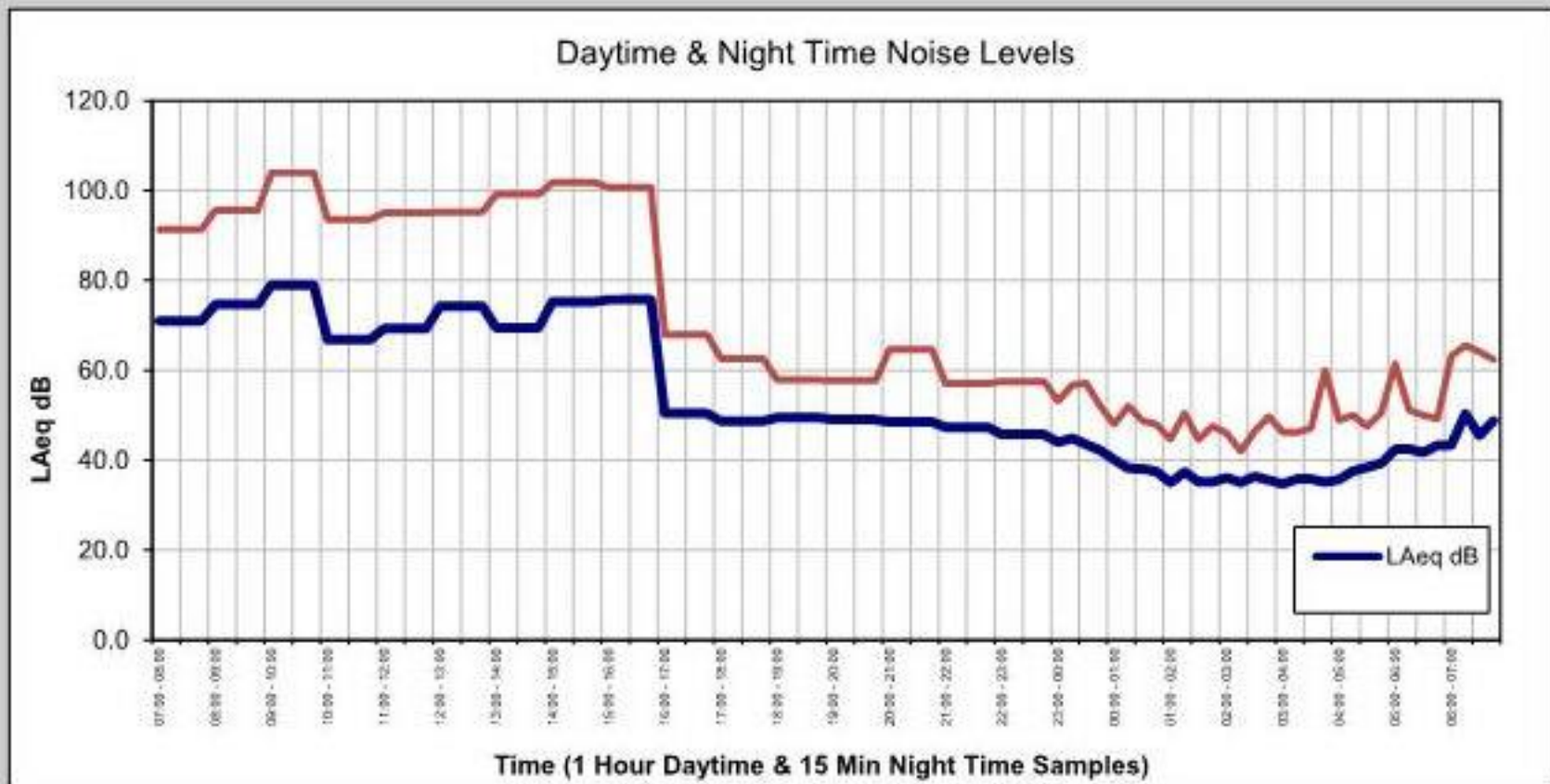
Date / Time	LAeq	LA90	Octave Band Centre Frequency (Hz)									
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
DAYTIME MODE 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	45.0	39.0	60.0	55.0	52.0	47.0	41.0	37.0	32.0	34.0	32.0	27.0



DAYTIME NOISE LEVELS 07:00 - 23:00												
Date / Time	LAeq	LA90	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	43.8	35.0	49.3	46.7	43.1	44.1	37.7	36.6	39.0	30.4	29.3	19.2
08:00 - 09:00	44.6	34.9	50.1	48.2	48.1	46.9	39.5	34.3	40.1	26.2	23.5	18.7
09:00 - 10:00	44.5	39.0	59.6	52.7	49.6	48.0	41.0	36.5	34.3	33.5	32.1	26.9
10:00 - 11:00	46.8	41.4	62.8	55.2	52.6	51.1	42.4	38.3	36.5	36.0	34.6	30.1
11:00 - 12:00	51.6	40.5	64.0	57.9	54.8	53.5	50.4	45.9	38.7	36.0	34.6	30.2
12:00 - 13:00	47.3	39.0	59.4	54.7	52.5	49.1	43.9	41.8	38.0	32.9	30.8	25.9
13:00 - 14:00	45.7	39.0	60.2	54.8	51.9	49.4	40.8	38.5	36.5	33.9	31.8	27.1
14:00 - 15:00	48.2	40.0	61.6	55.0	51.0	48.1	43.2	43.1	41.1	35.8	34.0	28.8
15:00 - 16:00	49.5	42.6	64.4	57.4	53.1	50.8	44.4	44.0	41.0	39.0	37.2	32.6
16:00 - 17:00	44.4	38.5	53.2	52.1	49.3	46.6	41.4	39.1	31.7	33.9	24.3	16.0
17:00 - 18:00	47.7	39.0	54.9	52.3	51.9	49.9	48.3	40.2	31.9	25.2	22.7	17.2
18:00 - 19:00	43.4	38.4	52.9	50.6	47.8	44.6	41.1	39.0	32.1	24.8	22.2	16.8
19:00 - 20:00	43.7	39.3	57.2	52.5	52.6	46.9	39.8	37.3	32.0	29.8	27.8	22.5
20:00 - 21:00	44.3	39.3	59.3	52.3	49.8	47.6	41.0	37.9	33.2	31.3	29.6	24.3
21:00 - 22:00	45.1	39.9	62.6	55.0	52.4	49.2	40.0	37.4	34.3	33.8	32.2	27.1
22:00 - 23:00	40.3	36.6	57.2	50.0	45.3	42.7	35.6	34.7	30.4	28.9	27.2	22.1

10.6 07:00 – 07:00 on 9th November 2016 Source

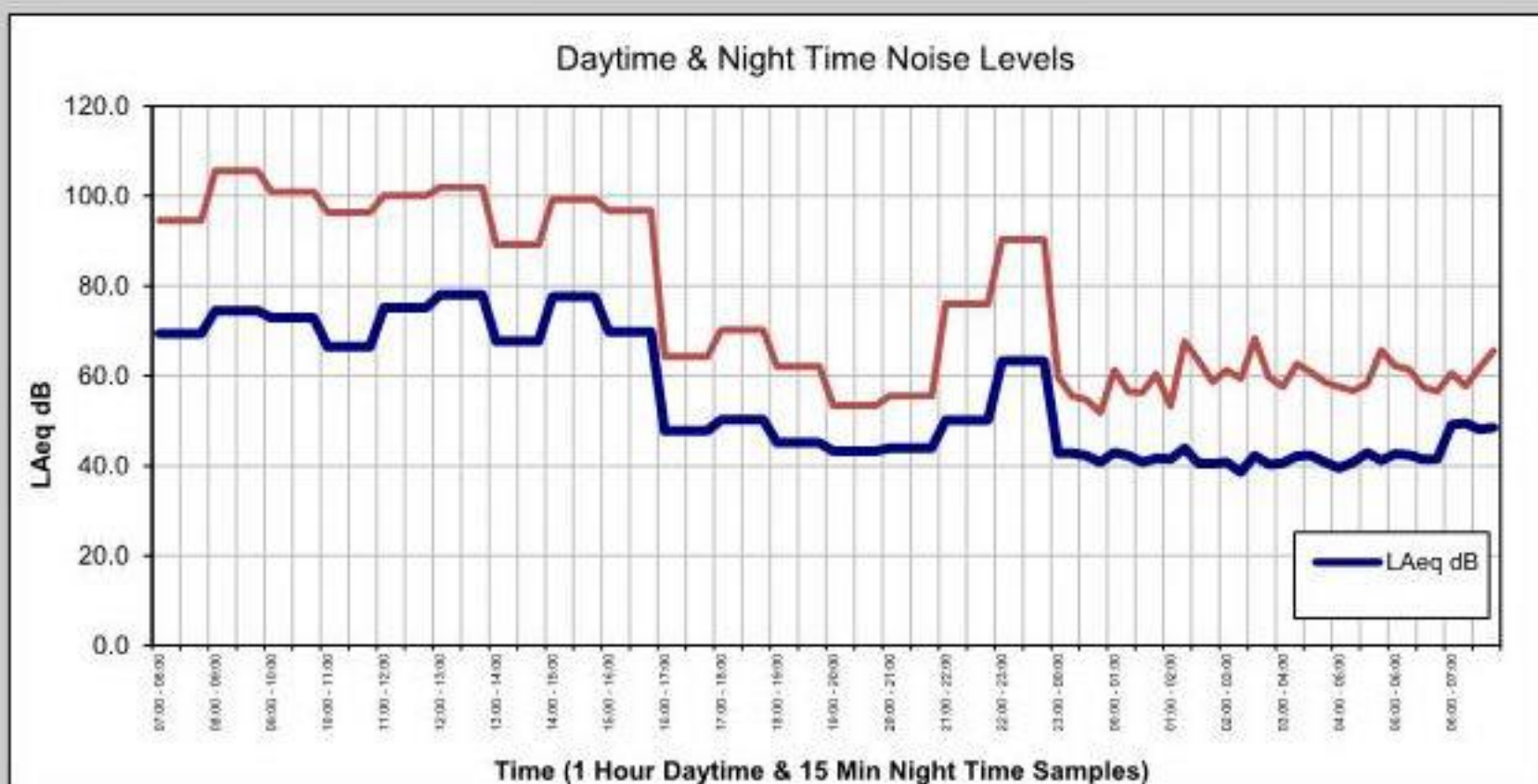
Date / Time	LAeq	LA90	Octave Band Centre Frequency (Hz)									
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
DAYTIME MODE 07:00 - 23:00 L _{A90} 1 HOUR & Corresponding L _{Aeq} 1 HOUR	71.8	96.6	76.0	73.4	67.8	65.1	64.3	66.0	64.9	63.6	63.8	58.4



DAYTIME NOISE LEVELS 07:00 - 23:00												
Date / Time	LAeq	LA90	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	71.0	91.3	80.3	76.5	70.4	66.9	63.4	66.5	65.9	58.0	51.2	44.3
08:00 - 09:00	74.6	95.5	76.7	77.1	69.7	68.9	67.5	67.2	66.4	67.4	69.2	63.3
09:00 - 10:00	79.0	103.9	73.9	73.6	71.4	69.0	69.9	70.8	71.4	72.5	73.6	68.0
10:00 - 11:00	66.7	93.5	75.7	75.6	68.6	64.5	60.1	63.0	59.7	54.1	50.7	47.5
11:00 - 12:00	69.3	95.0	77.1	75.9	69.8	64.0	61.2	67.3	59.8	51.7	45.9	37.9
12:00 - 13:00	74.3	95.2	83.5	76.9	70.3	67.7	67.1	69.2	68.9	64.6	59.7	56.3
13:00 - 14:00	69.5	99.1	76.3	73.5	66.7	64.7	64.9	64.7	61.9	59.6	57.9	53.9
14:00 - 15:00	75.3	101.8	77.3	77.3	72.7	70.4	69.3	70.1	67.7	66.5	66.4	62.1
15:00 - 16:00	75.7	100.7	77.0	74.5	70.0	67.9	67.8	71.2	70.2	66.0	59.9	53.2
16:00 - 17:00	50.4	67.9	63.6	57.2	55.0	49.0	45.2	47.0	41.8	33.4	36.0	22.8
17:00 - 18:00	48.7	62.6	56.9	53.9	47.4	45.5	43.5	46.2	40.3	27.4	18.4	11.9
18:00 - 19:00	49.5	57.8	55.3	52.6	49.9	46.0	44.0	47.1	40.9	27.4	18.5	12.4
19:00 - 20:00	49.0	57.7	53.5	51.0	47.3	45.9	44.0	46.7	40.0	26.1	17.2	12.0
20:00 - 21:00	48.5	64.7	50.9	49.4	46.4	44.7	43.1	46.3	40.1	27.6	20.1	12.9
21:00 - 22:00	47.3	57.0	50.1	48.7	45.4	43.8	42.3	45.1	38.5	26.0	18.4	12.0
22:00 - 23:00	45.7	57.5	48.6	47.2	44.9	43.1	40.9	43.4	36.6	24.4	17.2	11.5

10.7 07:00 – 07:00 on 10th November 2016 Source

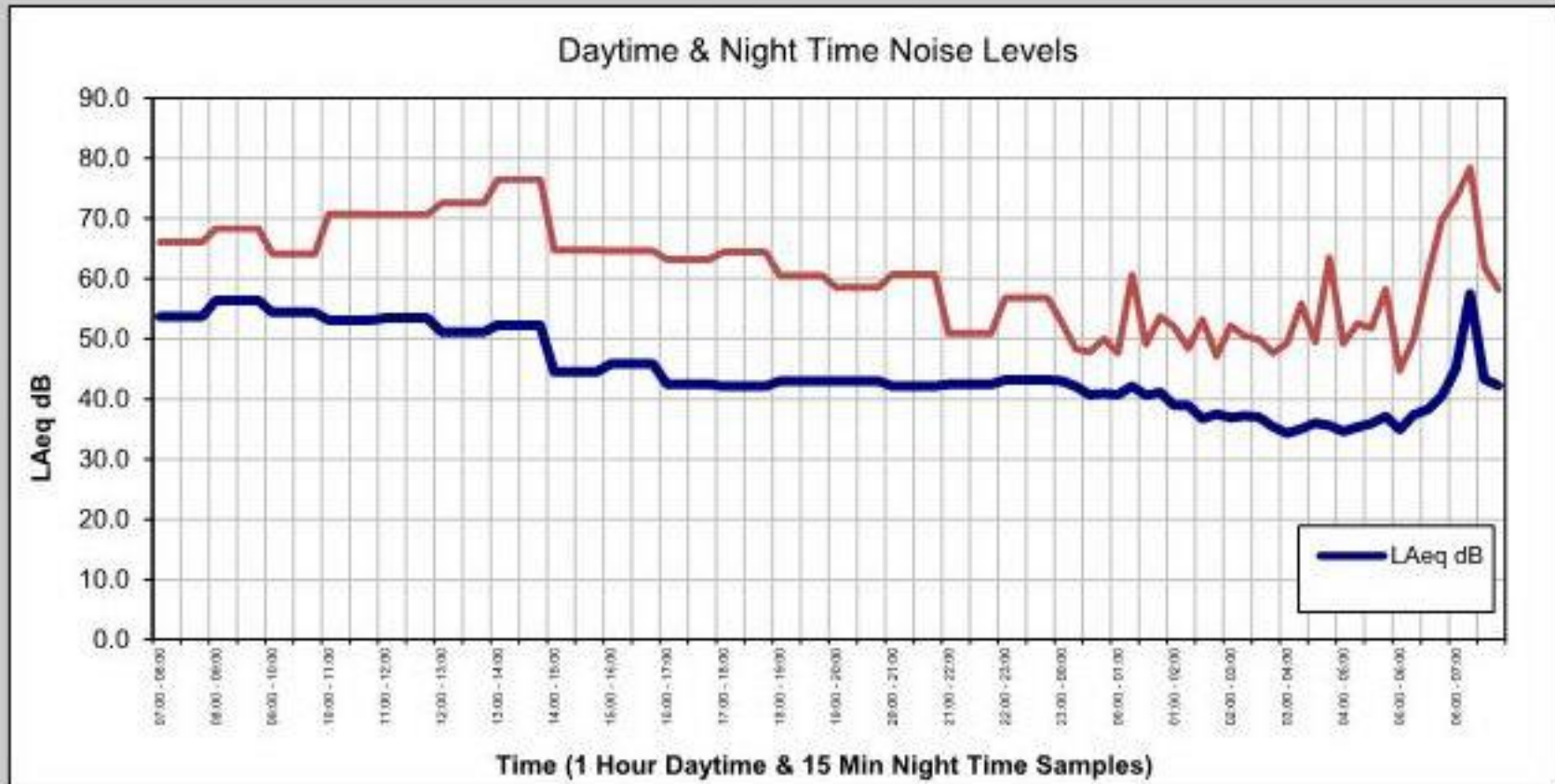
Date / Time	LAeq	LA90	Octave Band Centre Frequency (Hz)									
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
DAYTIME MODE 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	71.6	97.8	71.7	71.8	67.0	65.8	64.9	66.6	64.9	62.8	61.5	56.0



DAYTIME NOISE LEVELS 07:00 - 23:00												
Date / Time	LAeq	LA90	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	69.4	94.6	76.3	73.2	67.5	64.8	63.1	64.8	62.1	60.4	58.0	52.2
08:00 - 09:00	74.5	105.6	71.7	70.8	68.9	69.5	70.7	71.0	66.2	62.7	58.9	52.6
09:00 - 10:00	72.9	101.0	74.7	73.8	68.5	66.2	68.0	70.0	64.7	59.4	55.6	49.8
10:00 - 11:00	66.5	96.3	71.8	69.8	63.7	62.7	61.8	63.1	58.9	51.7	49.5	41.8
11:00 - 12:00	75.2	100.1	73.2	73.7	72.1	71.9	70.0	70.6	67.5	65.3	64.2	58.3
12:00 - 13:00	78.1	101.9	73.0	71.2	70.9	69.6	67.8	70.8	71.9	71.1	71.0	66.2
13:00 - 14:00	67.7	89.1	71.4	69.8	65.4	61.2	58.4	63.6	62.2	56.9	52.7	47.5
14:00 - 15:00	77.6	99.3	78.0	80.4	73.2	71.1	69.3	72.2	71.5	69.4	66.7	59.5
15:00 - 16:00	69.8	96.7	72.3	73.1	66.8	65.2	60.9	64.5	64.4	60.7	58.0	52.1
16:00 - 17:00	47.7	64.3	57.2	52.6	44.7	43.7	42.9	45.0	39.4	31.7	32.7	18.1
17:00 - 18:00	50.3	70.2	58.6	55.4	53.8	53.1	46.7	46.2	38.9	27.1	18.9	12.7
18:00 - 19:00	45.1	62.1	52.4	49.6	42.1	40.1	40.7	43.4	34.3	20.6	14.3	10.9
19:00 - 20:00	43.3	53.4	50.5	48.4	41.3	38.5	37.9	41.6	32.9	15.8	11.9	10.4
20:00 - 21:00	44.0	55.6	50.5	47.8	43.7	38.4	38.3	42.3	34.2	18.1	13.7	10.5
21:00 - 22:00	50.2	76.0	49.0	46.6	46.1	41.7	41.0	44.7	45.1	42.2	30.3	13.6
22:00 - 23:00	63.3	90.3	51.8	46.9	50.6	57.1	61.2	58.8	55.4	51.2	42.6	30.3

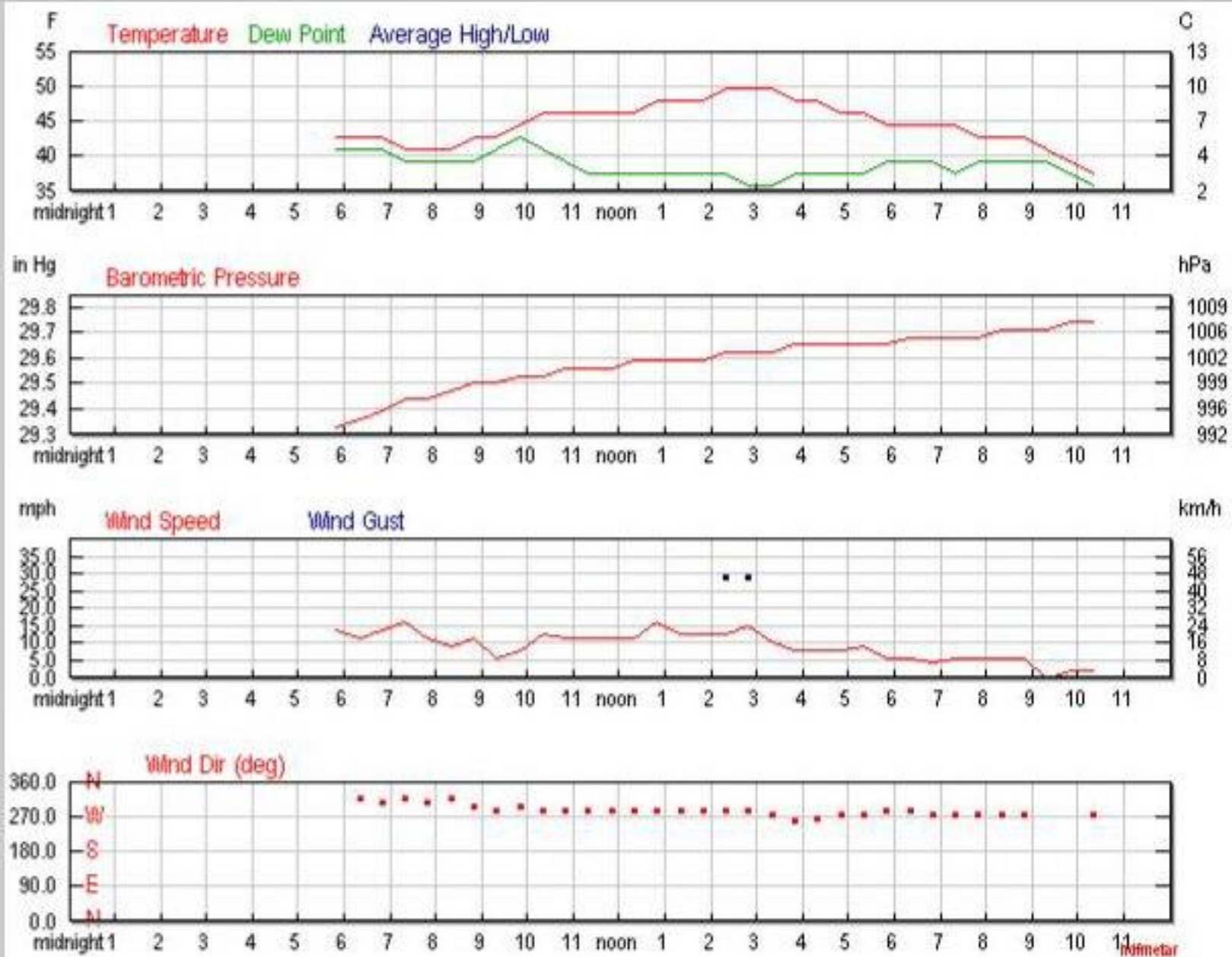
10.8 07:00 – 07:00 on 11th November 2016 Source

Date / Time	LAeq	LA90	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 MODE 07:00 - 23:00 LA90 1 HOUR & Corresponding LAeq 1 HOUR	50.6	68.5	62.5	57.6	48.0	46.2	44.5	46.8	44.2	38.4	35.6	30.4

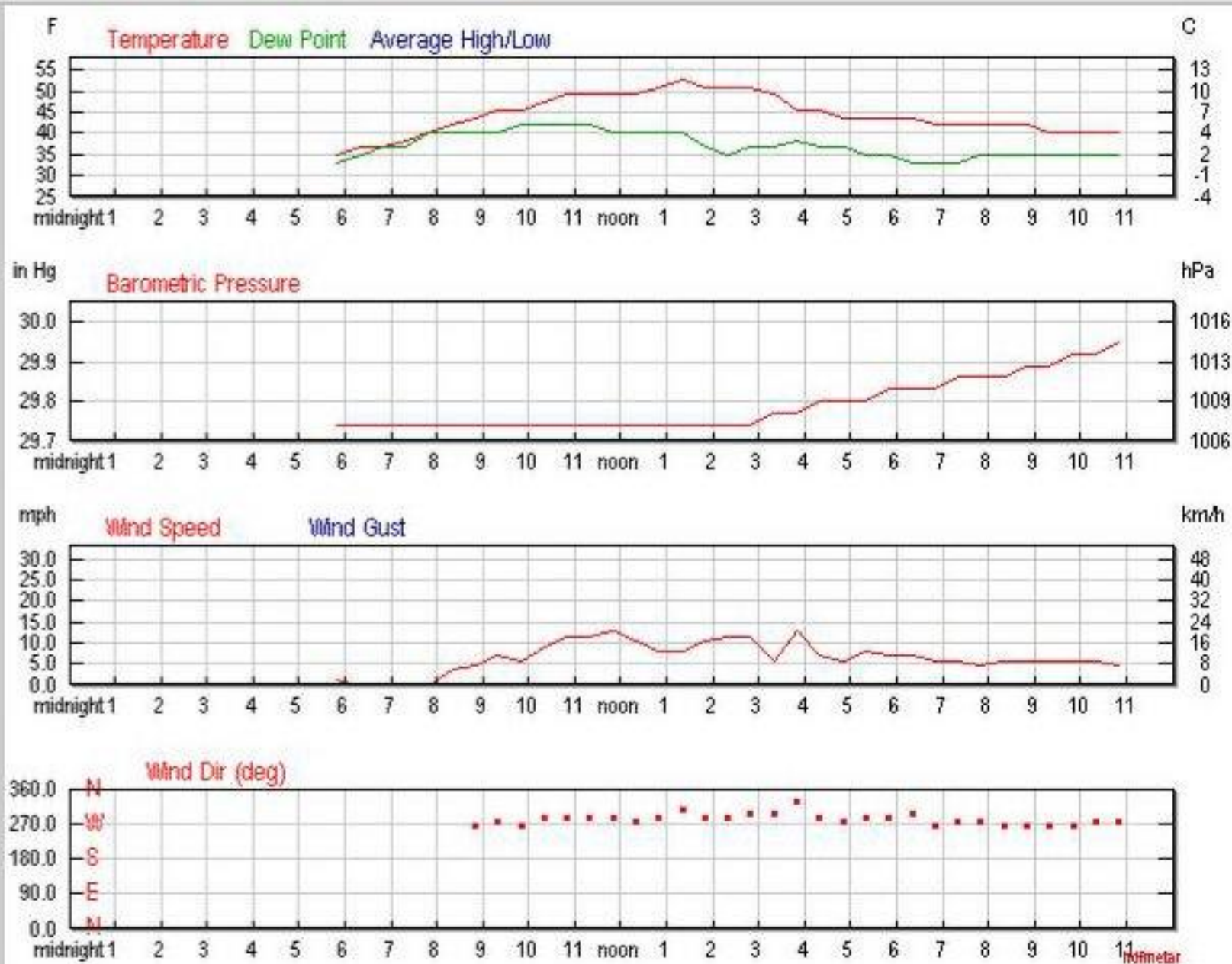


DAYTIME NOISE LEVELS 07:00 - 23:00												
Date / Time	LAeq	LA90	Octave Band Centre Frequency (Hz)									
			31.5	63	125	250	500	1.0 k	2.0 k	4.0 k	8.0 k	16.0 k
07:00 - 08:00	53.7	66.1	59.9	52.5	48.7	45.0	45.7	49.4	48.0	43.2	40.9	35.7
08:00 - 09:00	56.4	68.3	59.6	54.8	50.1	49.3	48.3	52.2	50.7	45.1	43.3	38.8
09:00 - 10:00	54.4	64.1	60.4	54.0	46.2	45.7	46.7	50.5	48.5	42.9	40.6	36.1
10:00 - 11:00	53.1	70.7	69.1	65.0	53.5	49.6	48.6	49.5	45.5	38.1	32.6	26.1
11:00 - 12:00	53.5	70.6	70.1	64.4	52.0	48.6	48.1	49.9	46.6	40.0	33.0	23.1
12:00 - 13:00	51.1	72.6	66.9	62.1	48.6	45.9	45.8	47.9	43.8	37.5	34.0	26.4
13:00 - 14:00	52.3	76.4	59.4	55.1	51.8	53.2	48.8	47.5	44.4	38.6	33.0	23.0
14:00 - 15:00	44.5	64.7	55.4	50.6	41.6	36.7	36.0	40.0	39.4	32.8	30.4	16.1
15:00 - 16:00	45.8	64.6	53.1	49.9	45.1	38.4	37.7	41.3	40.1	35.5	33.6	26.0
16:00 - 17:00	42.5	63.2	52.1	49.6	42.3	37.9	35.6	38.1	35.9	32.4	30.2	25.5
17:00 - 18:00	42.1	64.4	53.4	49.8	43.2	40.1	37.4	39.1	33.6	26.0	21.2	17.1
18:00 - 19:00	42.9	60.5	51.0	48.9	43.1	42.1	38.3	40.5	32.4	20.4	15.0	11.9
19:00 - 20:00	43.0	58.5	50.1	47.9	43.4	42.8	38.6	40.2	33.5	21.4	14.8	11.3
20:00 - 21:00	42.1	60.7	48.8	46.3	43.2	41.6	37.0	39.6	32.8	19.8	13.1	10.8
21:00 - 22:00	42.4	50.9	50.2	45.6	42.2	40.2	37.0	40.0	33.5	20.2	13.1	11.0
22:00 - 23:00	43.2	56.8	48.9	46.4	43.2	40.8	37.9	40.9	34.3	20.6	12.9	10.8

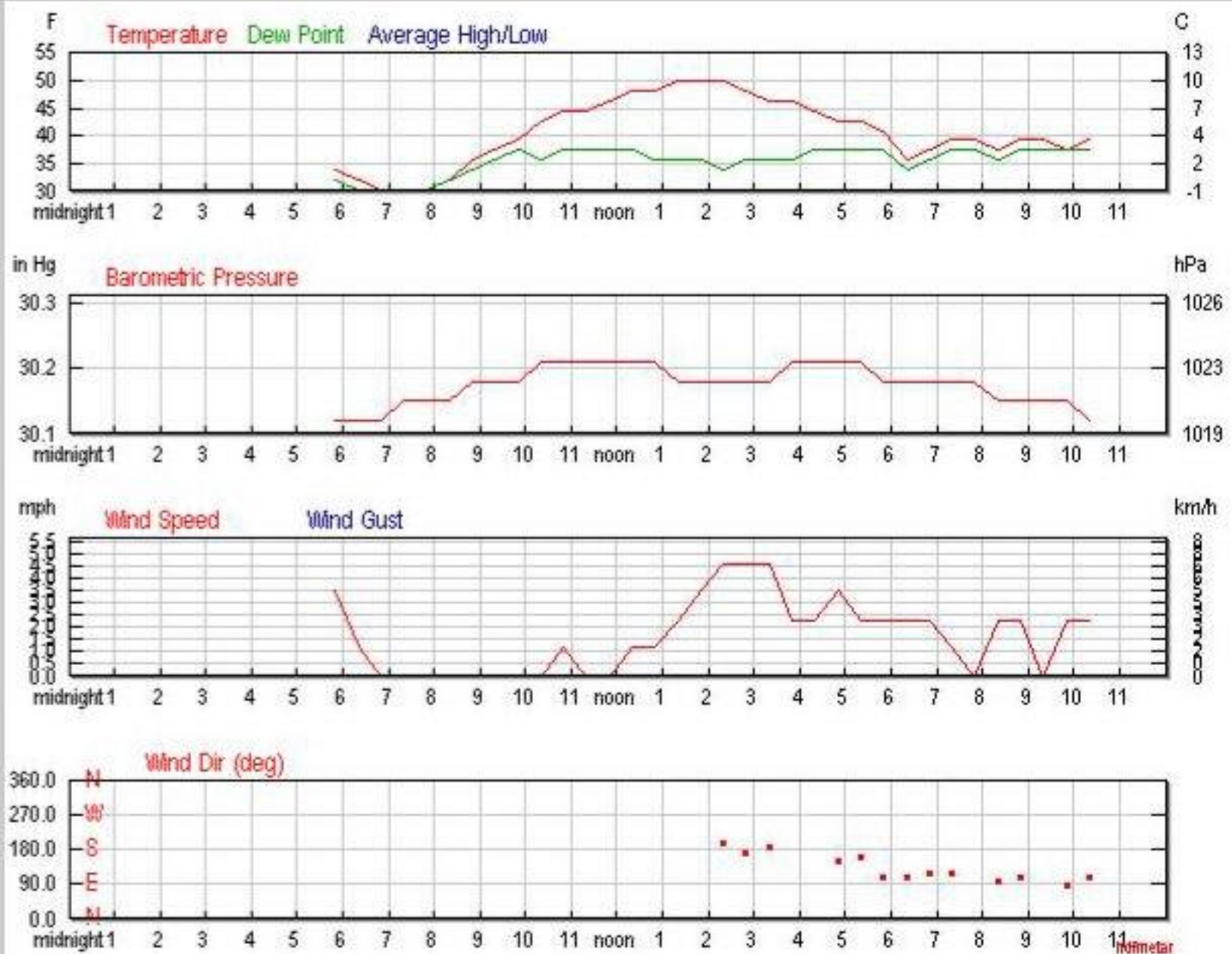
11 ENVIRONMENTAL CONDITIONS



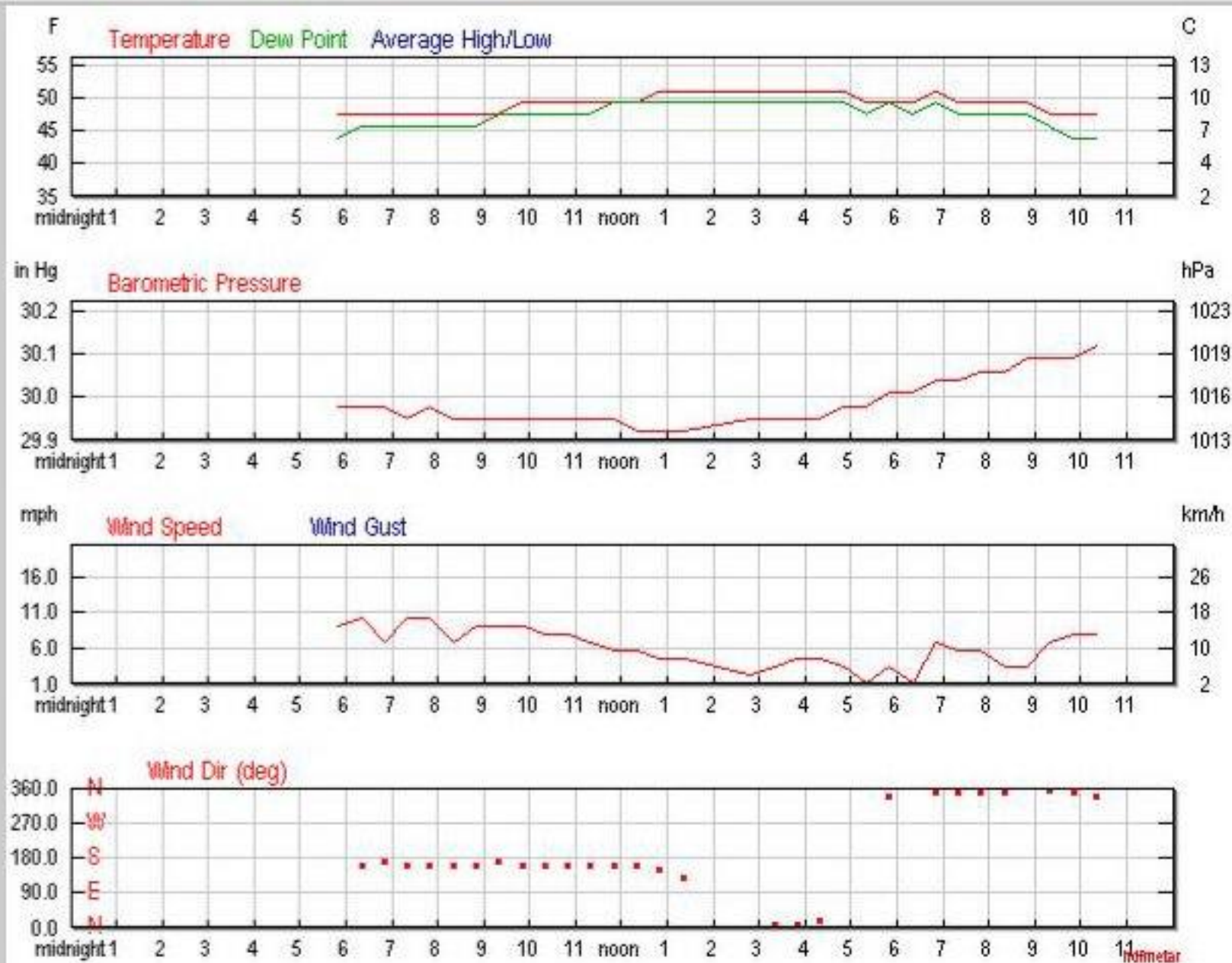
9th November 2016



10th November 2016



11th November 2016



12th November 2016

END OF REPORT