



REPORT AS10952.181217.RA (Stage 1)



PADNELL GRANGE
WATERLOOVILLE



STAGE 1 NOISE RISK ASSESSMENT

Prepared: 21 December 2018



Bellway Homes Ltd (Wessex)

Bellway House
Embankment Way
Ringwood
BH24 1EU



CONTENTS

1.0	EXECUTIVE SUMMARY	2
2.0	INTRODUCTION	2
3.0	SITE DESCRIPTION	2
4.0	ENVIRONMENTAL NOISE SURVEY	3
4.1	<i>Procedure and Equipment</i>	3
4.2	<i>Results</i>	3
4.3	<i>Uncertainty</i>	4
5.0	CONCLUSION	4

List of Attachments

AS10952/PPG	Initial Noise Risk Assessment Summary
AS10952/SP1	Indicative Site Plan
AS10952/TH1-TH3	Environmental Noise Time Histories
Appendix A	Acoustic Terminology
	Noise Report Framework (Audit Sheet)

1.0 EXECUTIVE SUMMARY

Clarke Saunders Associates has been commissioned by Bellway Homes to undertake environmental noise monitoring at Padnell Grange, Waterloooville, in order to assess its suitability for residential development.

The noise levels show that the site is suitable for residential development and as such, a Stage 2 Acoustic Design Statement is not considered necessary.

2.0 INTRODUCTION

Bellway Homes Ltd (Wessex branch) are proposing to develop land at Padnell Grange, Waterloooville, for 86 new residential properties.

Clarke Saunders Associates has been commissioned by Bellway Homes Ltd to undertake an assessment of the current environmental noise impact on the site. Noise will be assessed in accordance with the National Planning Policy Framework and the recently published *ProPG: Planning and Noise*¹ for new residential developments.

This report presents the results of the Stage 1 Risk Assessment which, if required, will be used to inform the requirement for a subsequent Stage 2 Acoustic Design Statement.

3.0 SITE DESCRIPTION

The site is located a minimum 450 metres west of the A3(M), which links Portsmouth and London. Between the site and the A3(M) is a golf course. To the south and west of site are residential properties, and a wooded area bounds the site to the north, beyond which are more residential properties.

The proposed development area is on a slight gradient; the eastern extent of site is elevated compared to the western extent.

¹ <http://ioa.org.uk/publications/propg>

4.0 ENVIRONMENTAL NOISE SURVEY

4.1 Procedure and Equipment

A survey of the existing background noise levels was undertaken at the location shown in site plan AS10952/SP1 at ground floor level in free field conditions. Measurements of consecutive 5-minute L_{Aeq} , L_{Amax} , L_{A10} and L_{A90} sound pressure levels were taken between 12:30 hours on Tuesday 18th December and 15:40 hours on Thursday 20th December 2018.

Short term manual measurements were also undertaken on Tuesday 18th and Thursday 20th December at the locations shown in AS10952/SP1, to assess the variation in noise levels around the site caused by the differing distance to the A3(M).

The following equipment was used during the course of the survey:

- 2 no. Rion data logging sound level meter type NA28;
- 1 no. Norsonic data logging sound level meter type 118;
- Rion sound level calibrator type NC-74;
- Norsonic sound level calibrator type 1251.

The calibration of the sound level meters was verified before and after use. No significant calibration drift was detected.

The weather was mixed during the survey. There were, however, sufficient period of dry weather with light winds, which are suitable conditions for the measurement of environmental noise. Data measured during periods of inclement weather have been excluded from the analysis. These periods (during high winds and significant rainfall) are highlighted on the attached time histories.

Measurements were made following the procedures in BS 7445:1991 (ISO1996-2:1987) *Description and measurement of environmental noise Part 2- Acquisition of data pertinent to land use*.

Please refer to Appendix A for details of the acoustic terminology used throughout this report.

4.2 Results

Figures AS10952/TH1-TH4 show the L_{Aeq} , L_{Amax} , L_{A10} and L_{A90} sound pressure levels as time histories at the measurement position.

The ambient noise climate at the site is predominantly caused by road traffic noise on the A3(M). When stood at the eastern extent of the site, noise from the A3(M) was still the most significant

noise source; cars only pass by on Cherry Tree Avenue occasionally and the existing houses provide building mass screening.

The average noise levels for the daytime and night-time periods are shown in Table 4.1, along with the typical night-time maximum level.

Daytime L_{Aeq} , 16 hour	Night-time, L_{Aeq} , 8 hour	Typical Night-time*, L_{AFMax}
51 dB	40 dB	56 dB

Table 4.1 - Daytime and night-time average noise levels

* 90th percentile of the measured L_{AFMax} data has been used

The manual measurements undertaken demonstrated that the noise levels do not vary significantly over the site. The A3(M) is sufficiently distant that any screening afforded by buildings between the site and A3(M) is negligible. The noise levels shown in Table 4.1 are, therefore, deemed to be representative of the existing site noise climate as a whole.

4.3 Uncertainty

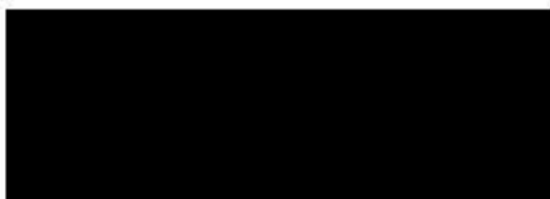
Use of a calibrated type 1 sound level meter is considered to reduce measurement instrument error to insignificant levels as compared with environmental variations.

Whilst the noise levels shown in Table 4.1 are considered to be representative of the site as a whole, on particular days the noise levels may be higher or lower. This variation is an inherent uncertainty in the environmental noise monitoring procedure, not an indication of error. Extended monitoring periods have been used to reduce this uncertainty, which in any case, would not change the conclusion of this report.

5.0 CONCLUSION

This Stage 1 Risk Assessment has identified the development site a negligible to low risk area, tending towards negligible risk, as defined in ProPG.

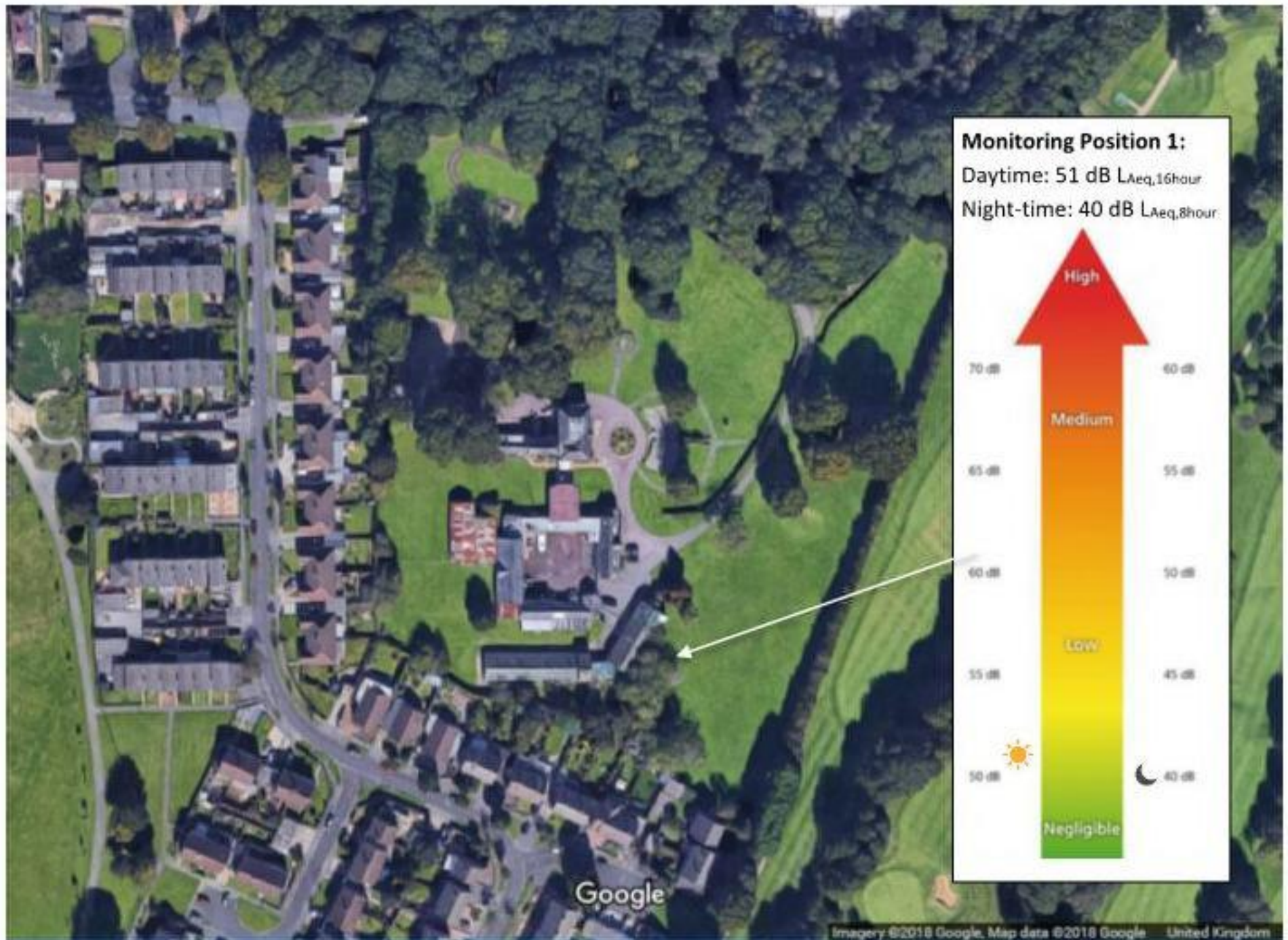
The ProPG guidance recommends that the development site is likely to be acceptable for residential development from a noise perspective and as such, a Stage 2 Acoustic Design Statement is not considered to be necessary.



Ian MacArthur MIOA

CLARKE SAUNDERS ASSOCIATES

ProPG: Initial Noise Risk Assessment of Proposed Residential Development Site



Executive Summary: A survey of the existing background noise levels was undertaken at the locations shown between 12:30 hours on Thursday 18th December and 15:40 hours on Thursday 20th December 2018. The measurement positions were in free-field conditions at ground floor level.

The dominant noise source is the A3(M), which is 450 metres east of the site.

The daytime and night-time noise levels measured on site are considered negligible to low risk. The development site is, therefore, considered to be acceptable from a noise perspective and as such, an Acoustic Design Statement is not considered to be necessary.

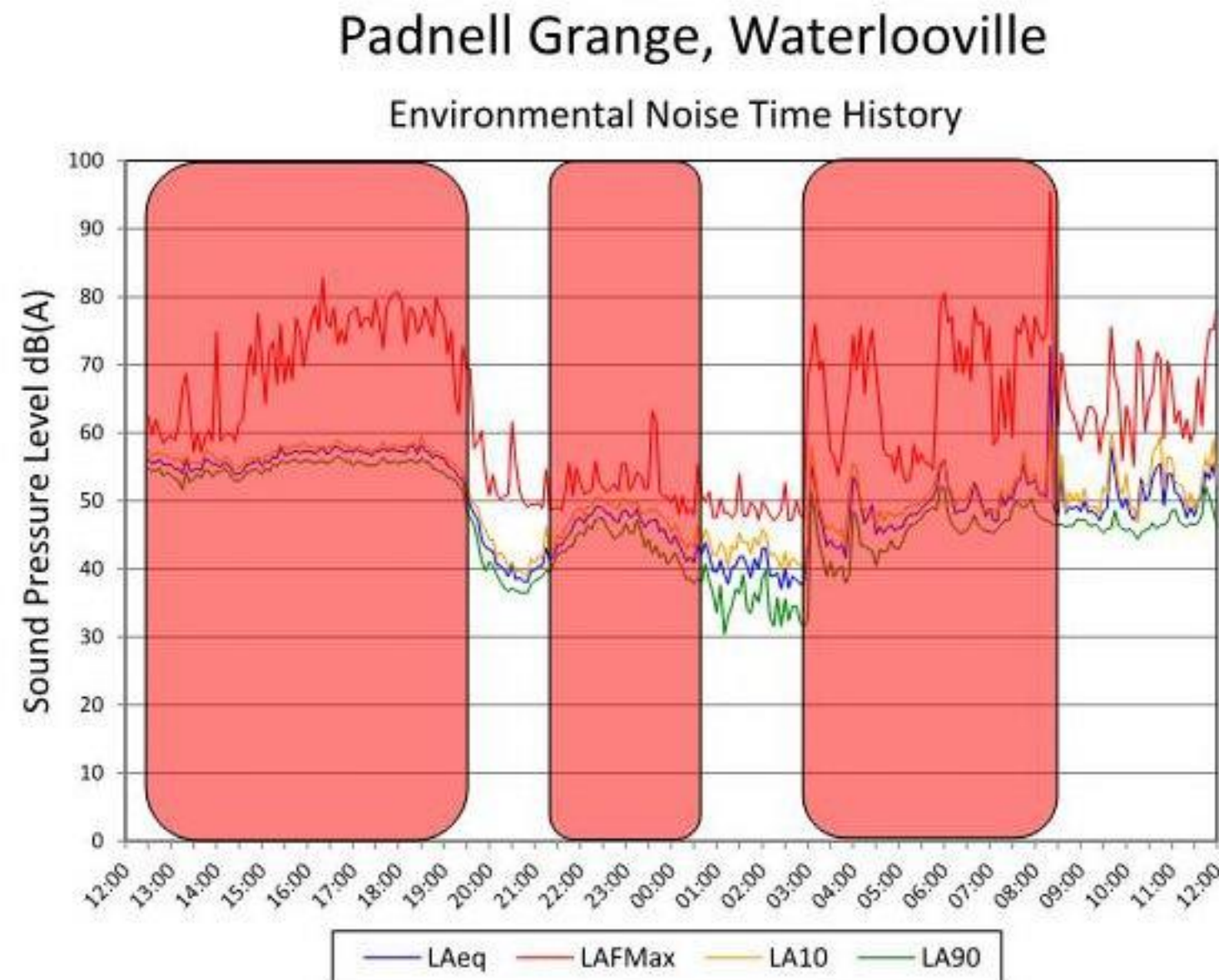
Project:
Padnell Grange, Waterloooville

Figure: AS10952/PPG01

Date: 21/12/2018

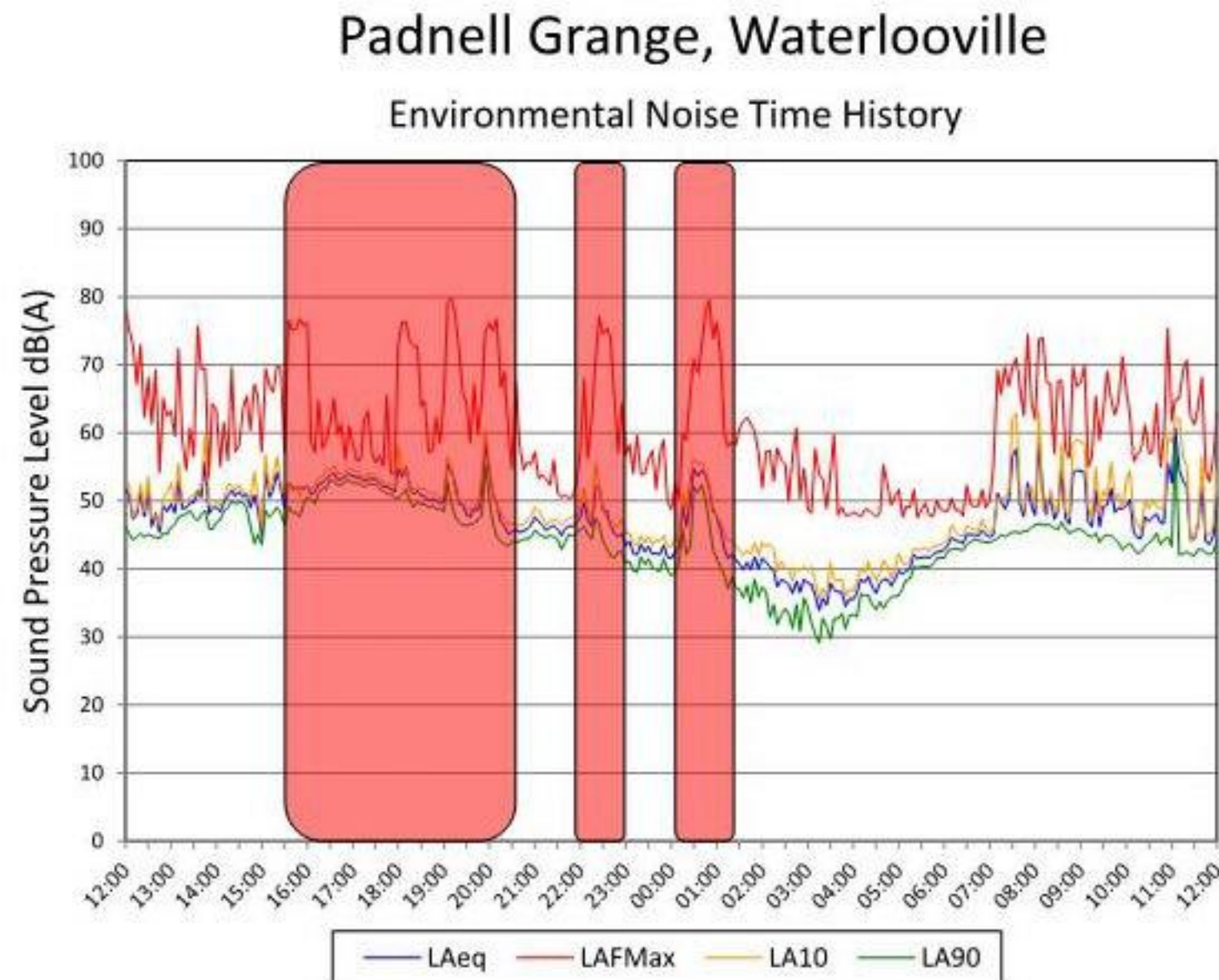


Figure AS10952/SP1



Tuesday 18 December to Wednesday 19 December 2018

Figure AS10952/TH1

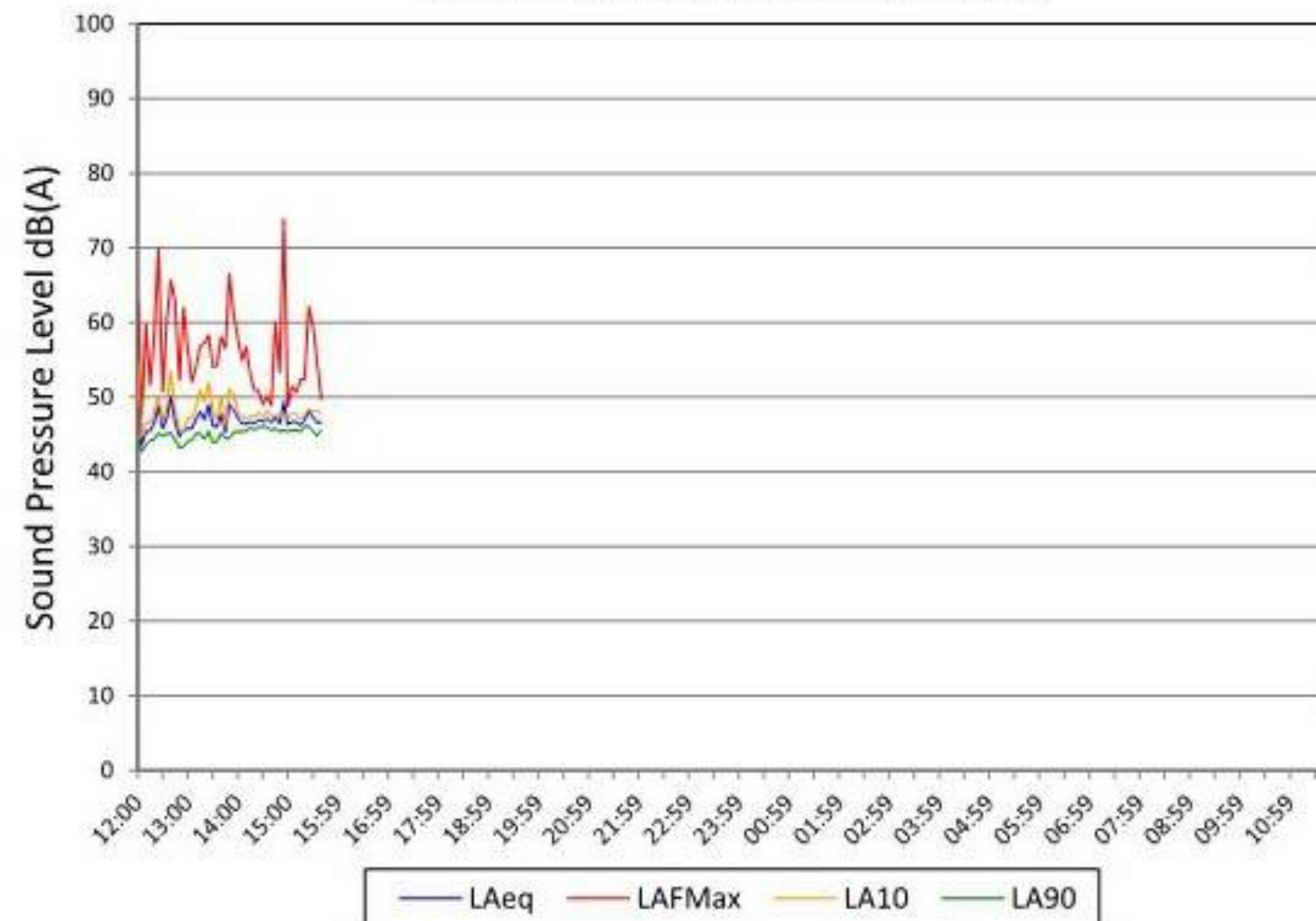


Wednesday 19 December to Thursday 20 December 2018

Figure AS10952/TH2

Padnell Grange, Waterloooville

Environmental Noise Time History



Thursday 20 December to Friday 21 December 2018

Figure AS10952/TH3

ACOUSTIC TERMINOLOGY & HUMAN RESPONSE TO BROADBAND SOUND

1.1 Acoustic Terminology

The human impact of sounds is dependent upon many complex interrelated factors such as 'loudness', its frequency (or pitch) and variation in level. In order to have some objective measure of the annoyance, scales have been derived to allow for these subjective factors.

Sound	Vibrations propagating through a medium (air, water, etc.) that are detectable by the auditory system.
Noise	Sound that is unwanted by or disturbing to the perceiver.
Frequency	The rate per second of vibration constituting a wave, measured in Hertz (Hz), where 1Hz = 1 vibration cycle per second. The human hearing can generally detect sound having frequencies in the range 20Hz to 20kHz. Frequency corresponds to the perception of 'pitch', with low frequencies producing low 'notes' and higher frequencies producing high 'notes'.
dB(A):	Human hearing is more susceptible to mid-frequency sounds than those at high and low frequencies. To take account of this in measurements and predictions, the 'A' weighting scale is used so that the level of sound corresponds roughly to the level as it is typically discerned by humans. The measured or calculated 'A' weighted sound level is designated as dB(A) or L_A .
L_{eq}:	A notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 8 hour, 1 hour, etc). The concept of L_{eq} (equivalent continuous sound level) has primarily been used in assessing noise from industry, although its use is becoming more widespread in defining many other types of sounds, such as from amplified music and environmental sources such as aircraft and construction. Because L_{eq} is effectively a summation of a number of events, it does not in itself limit the magnitude of any individual event, and this is frequently used in conjunction with an absolute sound limit.
L_{10} & L_{90}:	Statistical L_n indices are used to describe the level and the degree of fluctuation of non-steady sound. The term refers to the level exceeded for n% of the time. Hence, L_{10} is the level exceeded for 10% of the time and as such can be regarded as a typical maximum level. Similarly, L_{90} is the typical minimum level and is often used to describe background noise. It is common practice to use the L_{10} index to describe noise from traffic as, being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic flow.
L_{max}:	The maximum sound pressure level recorded over a given period. L_{max} is sometimes used in assessing environmental noise, where occasional loud events occur which might not be adequately represented by a time-averaged L_{eq} value.

1.2 Octave Band Frequencies

In order to determine the way in which the energy of sound is distributed across the frequency range, the International Standards Organisation has agreed on "preferred" bands of frequency for sound measurement and analysis. The widest and most commonly used band for frequency measurement and analysis is the Octave Band. In these bands, the upper frequency limit is twice the lower frequency limit, with the band being described by its "centre frequency" which is the average (geometric mean) of the upper and lower limits, e.g. 250 Hz octave band extends from 176 Hz to 353 Hz. The most commonly used octave bands are:

Octave Band Centre Frequency Hz	63	125	250	500	1000	2000	4000	8000
---------------------------------	----	-----	-----	-----	------	------	------	------

ACOUSTIC TERMINOLOGY & HUMAN RESPONSE TO BROADBAND SOUND

1.3 Human Perception of Broadband Noise

Because of the logarithmic nature of the decibel scale, it should be borne in mind that sound levels in dB(A) do not have a simple linear relationship. For example, 100dB(A) sound level is not twice as loud as 50dB(A). It has been found experimentally that changes in the average level of fluctuating sound, such as from traffic, need to be of the order of 3dB before becoming definitely perceptible to the human ear. Data from other experiments have indicated that a change in sound level of 10dB is perceived by the average listener as a doubling or halving of loudness. Using this information, a guide to the subjective interpretation of changes in environmental sound level can be given.

INTERPRETATION

Change in Sound Level dB	Subjective Impression	Human Response
0 to 2	Imperceptible change in loudness	Marginal
3 to 5	Perceptible change in loudness	Noticeable
6 to 10	Up to a doubling or halving of loudness	Significant
11 to 15	More than a doubling or halving of loudness	Substantial
16 to 20	Up to a quadrupling or quartering of loudness	Substantial
21 or more	More than a quadrupling or quartering of loudness	Very Substantial

1.4 Earth Bunds and Barriers - Effective Screen Height

When considering the reduction in sound level of a source provided by a barrier, it is necessary to establish the "effective screen height". For example if a tall barrier exists between a sound source and a listener, with the barrier close to the listener, the listener will perceive the sound as being louder if he climbs up a ladder (and is closer to the top of the barrier) than if he were standing at ground level. Equally if he sat on the ground the sound would seem quieter than if he were standing. This is explained by the fact that the "effective screen height" is changing with the three cases above. In general, the greater the effective screen height, the greater the perceived reduction in sound level.

Similarly, the attenuation provided by a barrier will be greater where it is aligned close to either the source or the listener than where the barrier is midway between the two.

NOISE REPORT AUDIT SHEET

This initiative was developed by representatives of the Hampshire and IOW Environmental Control Advisory Committee (ECAC) and Institute of Acoustics Southern Branch.
As part of this pilot initiative, Clarke Saunders is including this audit sheet for all planning related acoustic reports.

Client Brief

Brief Description	Proposal to develop land for 86 new residential properties at Padnell Grange, Waterloo, PO8 8AW
Design Input	Measuring site noise levels to inform initial ProPG noise risk assessment

Liaison with LA

Liaison with LA (Name/Date)	Havant B.C. EHO Mark Moss - 12/12/2018
Principles Agreed	Mark Moss confirmed that survey and assessment in accordance with ProPG Stage 1 is acceptable, based on likelihood of "low risk" being identified.

Check List	Page No(s)	Compliance		
		Y	N	N/A
Full site description/map provided	Page 2, attached site plan AS10912/SP1	Y		
Site history provided	---	---	---	N/A
Current and potential future acoustic environment identified	Page 3&4	Y		
Identification of relevant legislative framework	Page 2	Y		
Conceptual model fully justified	---	---	---	N/A
Inclusion of reporting elements of BS4142:2014 (Para 12 a to j)	---	---	---	N/A
Monitoring data fully representative	Page 3&4	Y		
Raw data presented	Attached Time Histories TH1-TH3	Y		
ADS included (where ProPG relevant)	Page 4 explains ADS is not considered necessary	---	---	N/A
Calculations and assumptions fully presented and justified	---	---	---	N/A
Uncertainty assessment provided	Page 4	Y		
Clear recommendations and conclusions	Page 4	Y		
Executive summary included	Page 2	Y		

Professional Statement - This report has been prepared independent of influence by the person(s) or instructing party, such that the technical content can be relied upon without knowingly containing altered, manipulated, fabricated or misrepresented data and it has been interpreted using reasonable care, professional knowledge and skill.
The report adheres with the principles required by the Institute of Acoustics in their Code of Conduct, and the work is within the author's (including secondary author if relevant) own area of knowledge and expertise. Where opinions have been expressed these represent true and complete professional opinions on the matters to which they refer.

Signed	Position	Dated
	Associate	21/12/2018

v1
v2

First issue - pilot
Second issue - pilot

24/10/2018
18/12/2018