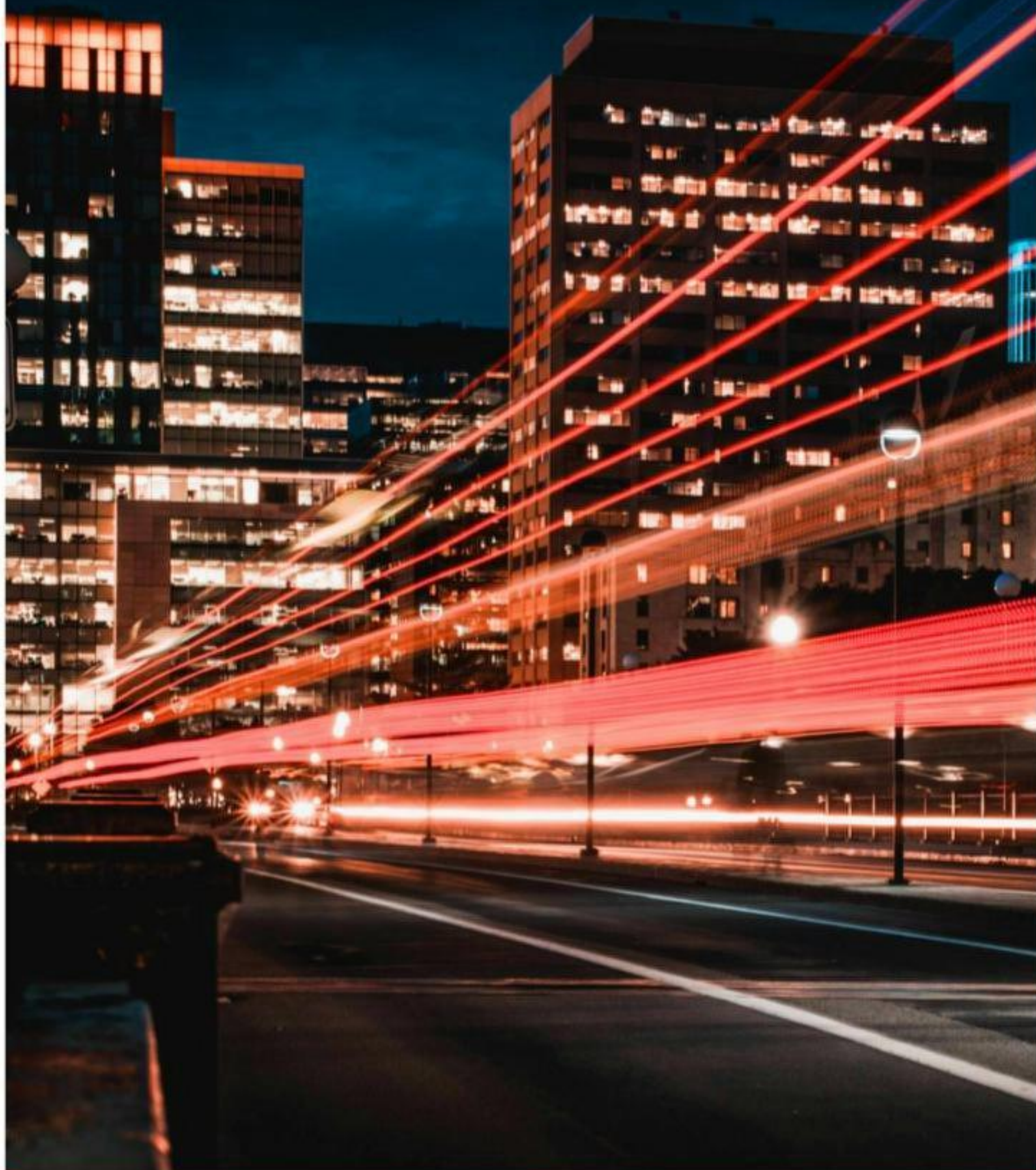




PREPARED: Wednesday, 03 April 2019

CAMP FIELD; NOISE IMPACT ASSESSMENT

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LIST OF ATTACHMENTS

AS11113/SP1	Indicative Site Plan
AS11113/TH1-TH4	Environmental Noise Time Histories
APPENDIX A	Acoustic Terminology Noise Report Audit Sheet

Project Ref:	AS11113	Title:	Camp Field, Bartons Road, Havant
Report Ref:	190327.NIA	Title:	Noise Impact Assessment
Client Name:	Chidden Farms		
Project Manager:	Daniel Saunders		
Report Author:	Daniel Saunders		
Clarke Saunders Acoustics Winchester SO22 5BE		This report has been prepared in response to the instructions of our client. It is not intended for and should not be relied upon by any other party or for any other purpose.	

1.0 EXECUTIVE SUMMARY

- 1.1 It is proposed to develop land at Camp Field, Bartons Road, Havant for residential use to accommodate up to 72 dwellings and public open space.
- 1.2 An environmental noise survey has been undertaken at the site by Clarke Saunders Acoustics between Friday 22nd and Tuesday 26th March 2018. The measured levels have been assessed with reference made to the relevant guidance set out in BS823:2014 *Guidance on sound insulation and noise reduction for buildings*, to provide the relevant details to respond to Havant Borough Council Environmental Health Consultation on Planning Application ref. CONS/19/00200.
- 1.3 The survey has allowed the minimum sound reduction requirements of the external building fabric to be established as an outline performance specification. Mitigation measures including close-boarded timber garden fencing and acoustically specified thermal double-glazing have been proposed. The acoustic performance of the external building fabric would be fully determined as the design progresses.

2.0 INTRODUCTION

- 2.1 It is proposed to develop land at Camp Field, Bartons Road, Havant for residential use to accommodate up to 72 dwellings and public open space, including a local community orchard to promote healthy eating, maintain the natural environment and encourage wildlife. This report provides the relevant details to respond to the suggested planning condition of the Havant Borough Council Environmental Health Consultee Response on Planning Application ref. CONS/19/00200, which states:

The applicant to confirm that the acoustic mitigation measures to be employed with regard to the building envelope, including fenestration and ventilation, for all residential units, will meet BS8233:2014 standards as recommended for indoor ambient noise levels for dwellings, especially in relation to living rooms and bedrooms i.e during the day (07:00 to 23:00) 35 dB L Aeq, 16 hour and at night (23:00 to 07:00) 30 dB L Aeq, 8 hour for bedrooms. Similarly for traditional external areas that are used for personal amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB LAeq with an upper guideline value of 55 dB LAeq in noisier environments.

- 2.2 Clarke Saunders Acoustics has been commissioned by Chidden Farms to undertake an assessment of the current environmental noise impact on the site, which will be assessed with reference made to the relevant guidance set out in BS823:2014 *Guidance on sound insulation and noise reduction for buildings*.
- 2.3 This assessment will also consider the requirement for any outline mitigation measures as appropriate for the proposed residential development in order to provide the information to discharge the planning condition.

3.0 LOCAL AUTHORITY CONSULTATION

- 3.1 CSA has liaised with Mark Moss, Environmental Health Officer at Havant Borough Council who authored the Consultee Response.

- 3.2 Mark Moss confirmed via email on Wednesday 20th March 2019 that an assessment considering any mitigation required to achieve the identified target criteria set out in the draft condition, where necessary would be sufficient for the outline planning application. Mitigation measures may include fencing and/or boundary screening, along with outline specification of glazing and alternative means of ventilation. It was agreed that a full Professional Practice Guidance on Planning and Noise (ProPG) assessment was not strictly necessary in this instance, however demonstrating the themes of the ProPG guidance would be appropriate.

4.0 SITE DESCRIPTION

- 4.1 The site is currently open agricultural land and is bounded by an ancient woodland area named Bartons Copse to the north/north-west, The Oaks Havant Crematorium access road to the east, Bartons Road to the south and a recently completed residential development to the west. The noise climate on the site is primarily determined by road traffic noise from Bartons Road.

5.0 DESIGN CRITERIA

5.1 BS8233:2014 GUIDANCE ON SOUND INSULATION AND NOISE REDUCTION FOR BUILDINGS

- 5.1.1 The guidance in this document indicates acceptable noise levels for various activities within residential dwellings. The relevant section of this standard is shown in the following table:

ACTIVITY	LOCATION	07:00 TO 23:00	23:00 TO 07:00
Resting	Living Room	35 dB $L_{Aeq, 16 \text{ hour}}$	-
Dining	Dining Room	40 dB $L_{Aeq, 16 \text{ hour}}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq, 16 \text{ hour}}$	30 dB $L_{Aeq, 8 \text{ hour}}$

Table 5.1 - Excerpt from BS8233:2014

- 5.1.2 For external areas the standard states the following:

For traditional external areas that are used for amenity space, such as garden patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments.

However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.

6.0 SURVEY PROCEDURE & EQUIPMENT

- 6.1 A survey of the existing background noise levels was undertaken at the location shown in site plan AS11113/SP1. Automated measurements of consecutive 5-minute LAeq, LAmaz, LA10 and LA90 sound pressure levels were taken between 14:00 hours on Friday 22nd March and 08:55 hours on Tuesday 26th March 2018. Additional manual measurements were conducted at satellite locations to establish any significant variation in noise levels across the site from nearby specific sources.
- 6.2 The following equipment was used during the course of the survey:
- Norsonic data logging sound level meter type 118;
 - GRAS environmental microphone type 41-AL;
 - Norsonic sound level calibrator type 1251.
- 6.3 The calibration of the sound level meters was verified before and after use. No significant calibration drift was detected. All equipment has current laboratory calibration and certification is available upon request.
- 6.4 The weather during the survey was dry with light winds, which made the conditions suitable for the measurement of environmental noise.
- 6.5 Measurements were made following procedures in BS7445:1991 (ISO1996-2:1987) *Description and measurement of environmental noise part 2 - acquisition of data pertinent to land use*.
- 6.6 Please refer to Appendix A for details of the acoustic terminology used throughout this report.

7.0 RESULTS & DATA ANALYSIS

- 7.1 Figures AS11113/TH1-4 show the LAeq, LAmaz, LA10 and LA90 sound pressure levels as time histories at the measurement position.
- 7.2 The average noise levels for the 'Daytime' and 'Night-time' periods are shown in the following table:

DAYTIME LAeq, 16 hour	NIGHT-TIME LAeq, 8 hour	TYPICAL NIGHT-TIME, LAFMax
68 dB	59 dB	79 dB

Table 7.1 - Daytime and night-time average noise level at the monitoring position

8.0 OUTLINE EXTERNAL BUILDING FABRIC PERFORMANCE

- 8.1 The following design review is based on the Stainsby Architect Master Plan and Design and Access Statement for the proposed development available at the time of writing. It should be noted that this is indicative of a site layout which could be adopted although acoustic performance of a finalised layout should be reviewed and may be considered as part of a subsequent reserved matters application.

- 8.2 The following is an outline performance specification to demonstrate feasibility of the site and that acceptable internal and external noise criteria can be achieved using standard acoustic mitigation measures.

8.3 NON-GLAZED FAÇADE ELEMENT

- 8.3.1 It has been assumed that all non-glazed elements, i.e. masonry walls/facings and the roof systems, will provide the following minimum sound insulation performances, when tested in accordance with ISO 10140-2:2010. This is likely to be achievable with a standard brick/block cavity masonry external wall construction.

ELEMENT	SINGLE FIGURE WEIGHTED SOUND REDUCTION FIGURE (dB)
Masonry	R_w 51

Table 8.1 - Assumed minimum sound reduction index of solid constructions

8.4 REQUIRED GLAZING PERFORMANCE

- 8.4.1 The minimum sound insulation specifications for the glazed elements of the building facades are given in the table below. These have been calculated using the monitoring data, based on typical room/window sizes for residential developments, assuming a 1.8m boundary close-boarded fence.

GLAZING TYPE	SINGLE FIGURE WEIGHTED SOUND REDUCTION FIGURE (dB)	VENTILATOR PERFORMANCE (dB)
Type A	R_w 31	$D_{n,e,w}$ 34
Type B	Standard Thermally Sealed Double Glazing	$D_{n,e,w}$ 30

Table 8.2 - Minimum required sound reduction indices for glazing and ventilators

- 8.4.2 Façades with a distance of greater than 22m from the centre of Bartons Road benefit from a significant degree of distance loss from road traffic noise, as well as screening afforded by 1.8m high close-boarded timber garden fence. It is expected that a proprietary standard, thermally sealed double-glazed unit should provide adequate sound reduction in these areas, specified as "Type B" in the above table. This is also applicable to any ground floor living/dining room within 22m from the Centre of Bartons Road, which will also benefit from screening afforded by 1.8m high close-boarded timber garden fences.
- 8.4.3 In order that windows may remain closed to maintain internal noise levels for any bedrooms within 22m from the centre of Bartons Road, it is expected that an alternative means of ventilation will be required. If passive ventilation (wall or trickle vents) are used, the "Type A" ventilator performance shown in the above table would be required. These figures stated are for a single vent per room. If multiple vents are required, then the performance requirement will increase by a value of equal to $10\log(N)$, with N being the total of vents serving the room. It should be noted that there is no reason why windows could not be opened as a matter of personal preference.

- 8.4.4 It is important that quoted minimum sound reduction specifications are met by the panels and windows, including frames, seals, etc. Glass performance alone is not an acceptable means of demonstrating compliance with the specification for window performance.
- 8.4.5 The sound reduction performance of the windows should be met with any proposed trickle vents installed and open. If this cannot be met then alternative means of ventilation may be required.
- 8.4.6 The specification values given above are based on typical room/window sizes for residential developments, and should be confirmed and updated, as necessary, as the design progresses and/or for alternative plot layouts.

9.0 AREAS OF EXTERNAL AMENITY

- 9.1 On the basis of the Stainsby Architect Master Plan, Design and Access Statement, and assumed 1.8m close-boarded timber garden fence, it is anticipated that noise levels in external amenity areas adjacent to Bartons Road would achieve the intent of the quoted guidance in BS8233:2014, generally achieving the upper guideline value of $L_{Aeq,16hour}$ 55 dB. All other external amenity areas benefit from a significant amount of screening and distance loss, and is therefore expected to comply with the lower guideline value of $L_{Aeq,16hour}$ 50 dB.
- 9.2 Given the nature of the proposed local community orchard, as set out in the Stainsby Architect Master Plan and Design and Access Statement, it is not expected to generate adverse noise impact on existing sensitive receptors or future occupants of the residential development.

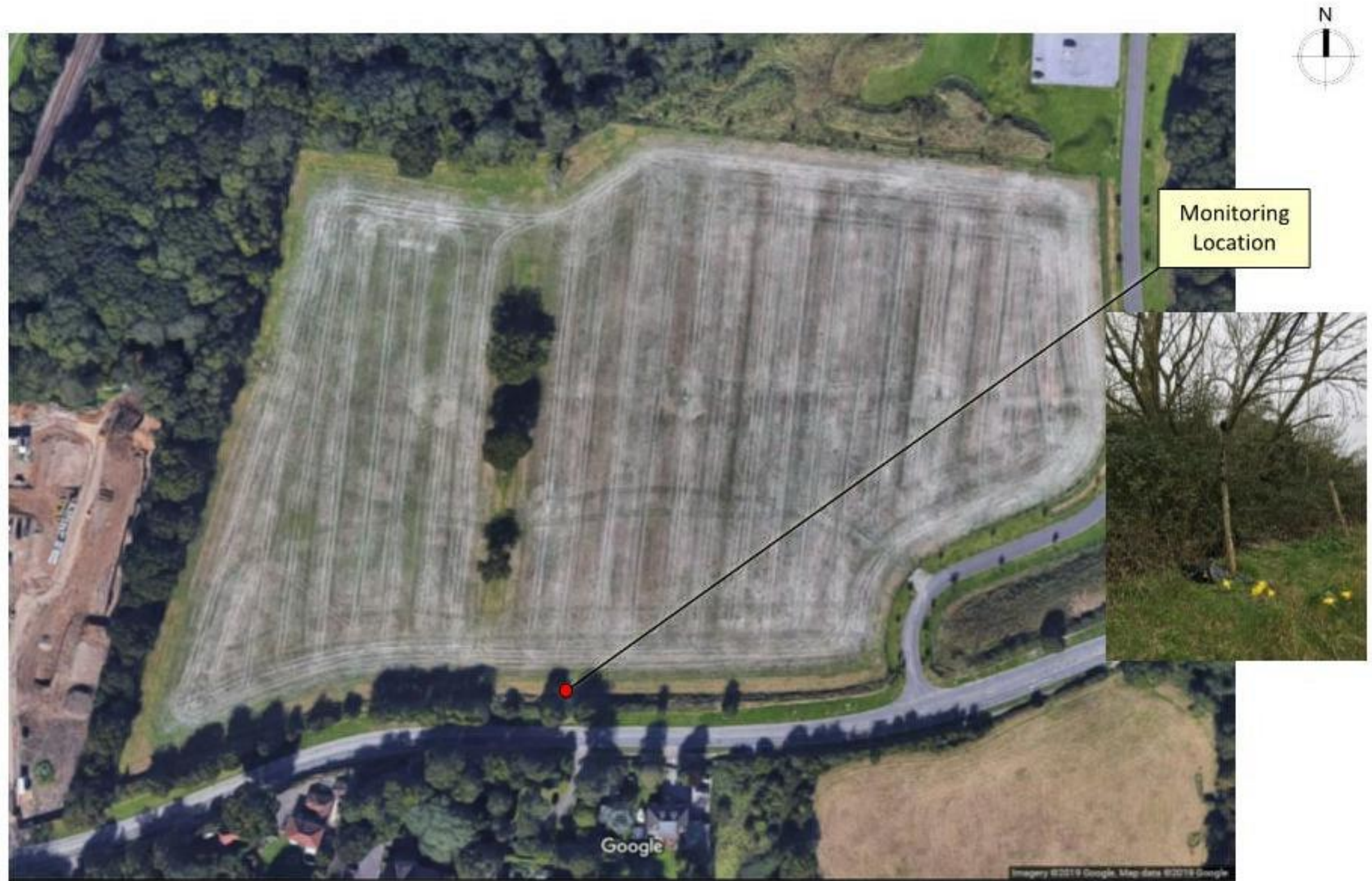
10.0 CONCLUSIONS

- 10.1 Measurements have been made of the prevailing noise climate at the proposed site for residential development at Camp Field, Bartons Road, Havant.
- 10.2 The measured levels have been assessed with reference made to the relevant guidance set out in BS8233:2014 *Guidance on sound insulation and noise reduction for buildings*, to provide the relevant details to respond to Havant Borough Council Environmental Health Consultation on Planning Application ref. CONS/19/00200.
- 10.3 The survey has allowed the minimum sound reduction requirements of the external building fabric to be established as an outline performance specification.
- 10.4 Mitigation measures including close-boarded timber garden fencing and acoustically specified thermal double-glazing have been proposed. The acoustic performance of the external building fabric would be fully determined as the design progresses.

- 10.5 It is important that the successful contractor demonstrates in UKAS accredited or an equal and approved laboratory that the minimum sound reduction requirements can be achieved by their proposed window systems.

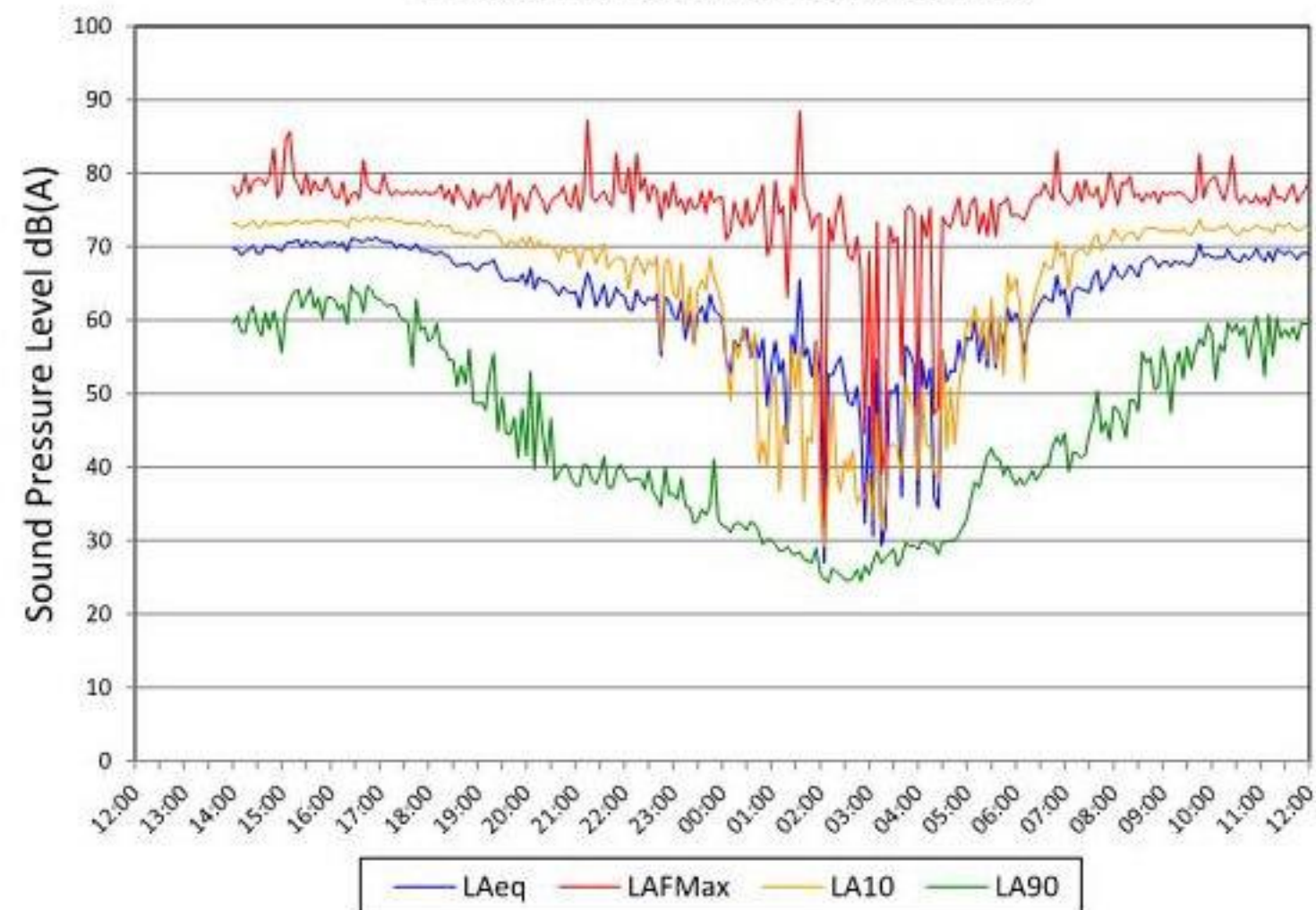


Daniel Saunders MIOA
CLARKE SAUNDERS ACOUSTICS



Camp Field, Bartons Road, Havant

Environmental Noise Time History

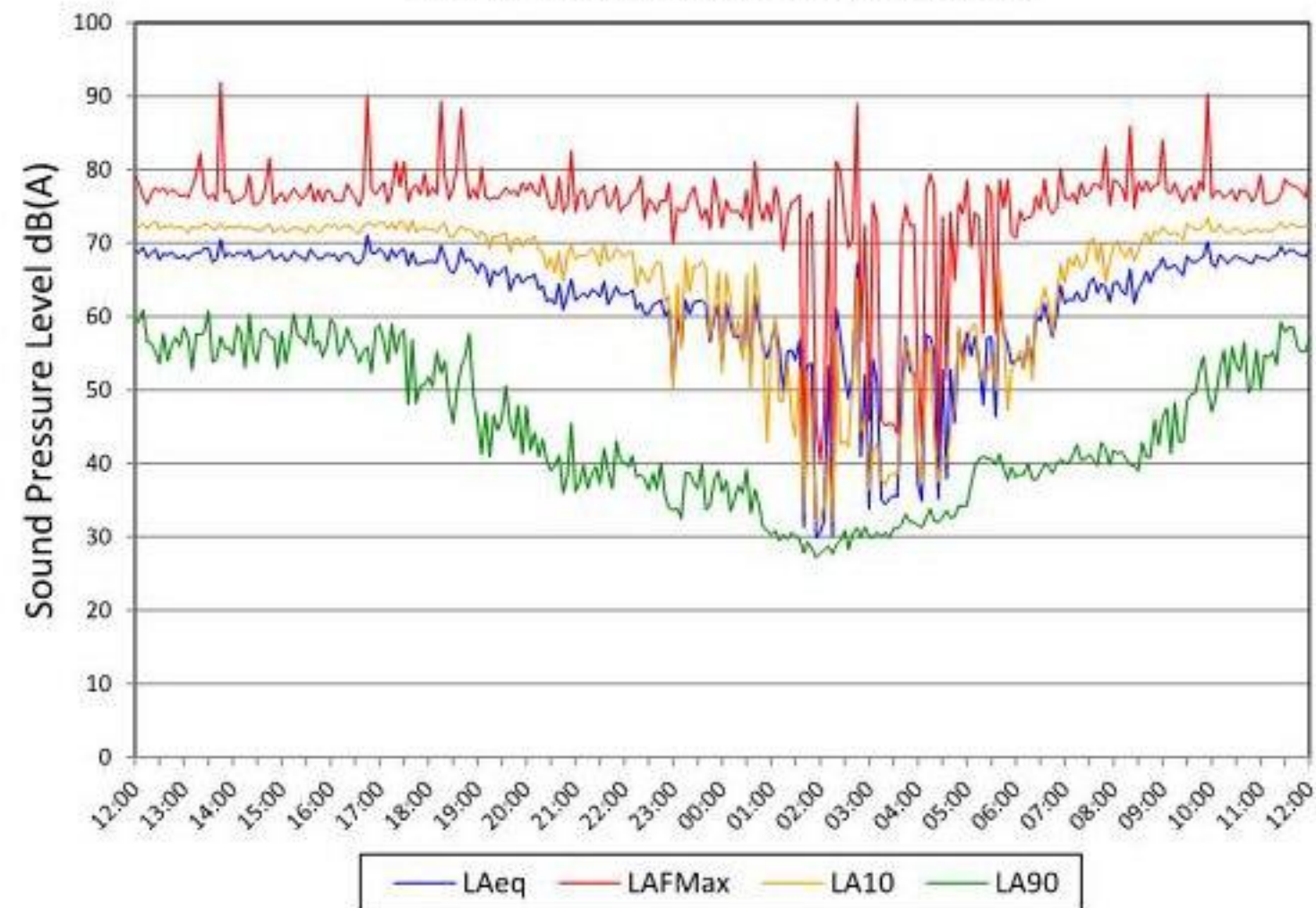


Friday 22 March to Saturday 23 March 2019

Figure AS11113/TH1

Camp Field, Bartons Road, Havant

Environmental Noise Time History

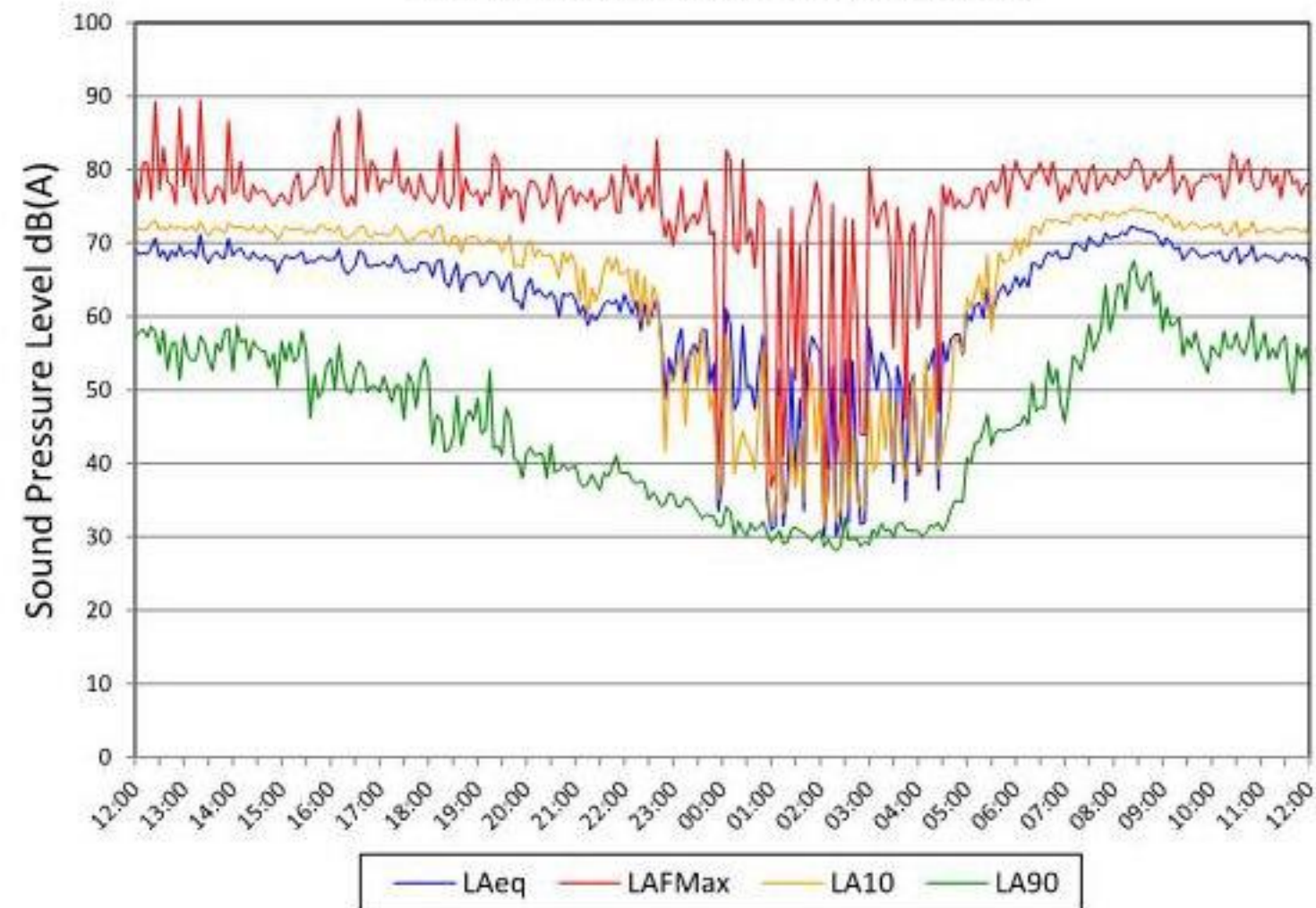


Saturday 23 March to Sunday 24 March 2019

Figure AS11113/TH2

Camp Field, Bartons Road, Havant

Environmental Noise Time History

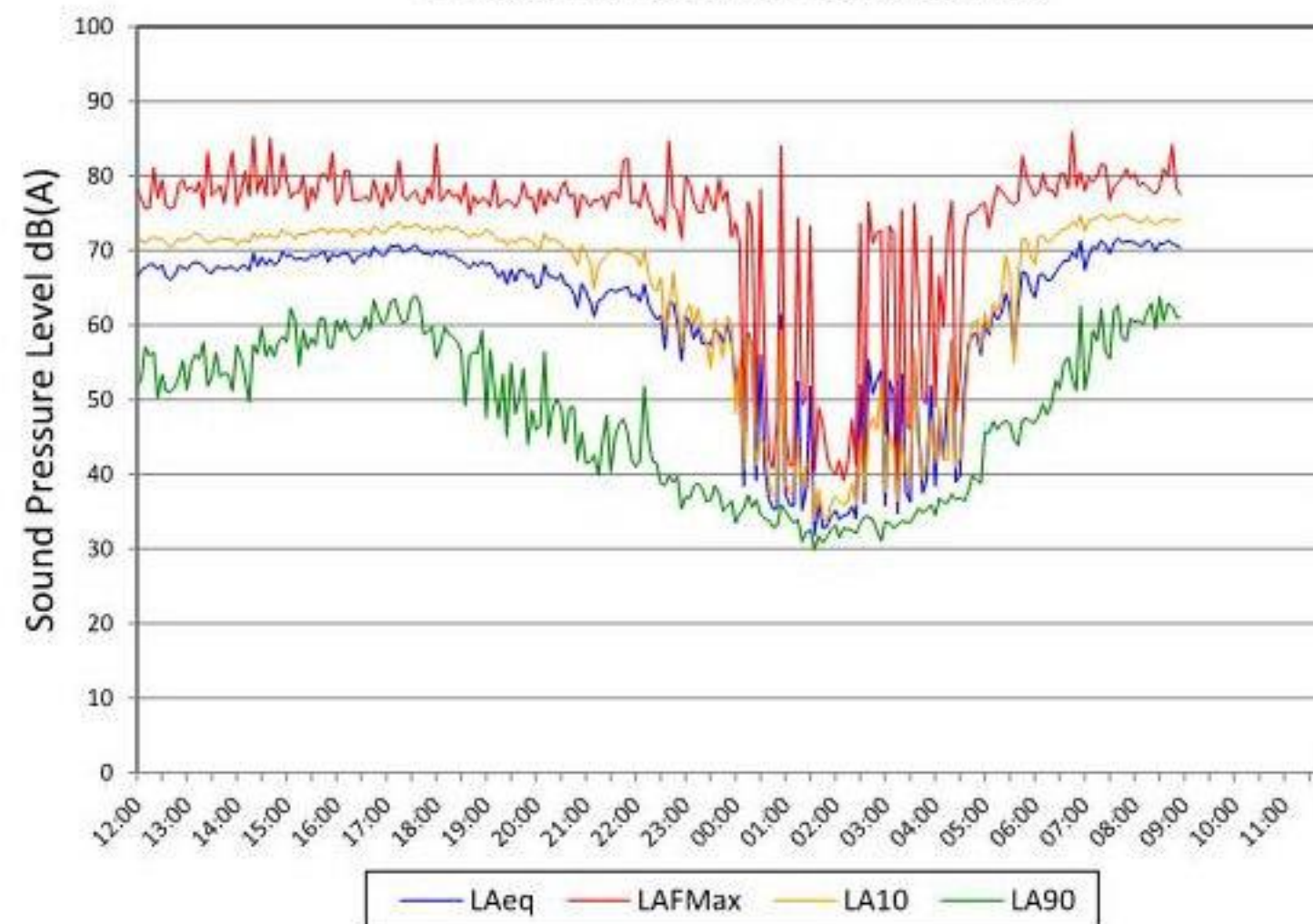


Sunday 24 March to Monday 25 March 2019

Figure AS11113/TH3

Camp Field, Bartons Road, Havant

Environmental Noise Time History



Monday 25 March to Tuesday 26 March 2019

Figure AS11113/TH4

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.
R	<i>Sound Reduction Index</i> . Effectively the <i>Level Difference</i> of a building element when measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-2:2010 and corrected for its size and the reverberant characteristics of the receive room.
D	The sound insulation performance of a construction is described in terms of the difference in sound level on either side of the construction in the presence of a sound source on one side and the reverberant characteristics of the adjoining 'receive' space. <i>D</i> is the arithmetic <i>Level Difference</i> in decibels between the source and receive sound levels when filtered into frequency bands.

D_{nT}	Weighted Standardised Level Difference. As defined in BS EN ISO 717-1, representing the <i>Weighted Level Difference</i> , when standardised for reference receiving room reverberant characteristics.
$D_{n,e}$	Normalised sound insulation of small building elements of fixed dimensions, such as vents, measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-2:2010.
$D_{n,f}$	Flanking sound insulation of lightweight elements, such as curtain wall mullions, measured in an accredited laboratory test suite in accordance with the procedures laid down in ISO 10848-2:2006
R_w $D_{nT,w}$ $D_{n,e,w}$ $D_{n,f,w}$	Value of parameter, determined as above, but weighted in accordance with the procedures laid down in BS EN ISO 717-1 to provide a single-figure 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
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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	To undertake an assessment of the current environmental noise impact on the site, which will be assessed with reference made to the relevant guidance set out in BS823:2014 Guidance on sound insulation and noise reduction for buildings, to provide the relevant details to respond to Havant Borough Council Environmental Health Consultation on Planning Application ref. CONS/19/00200.
Design Input	Outline external building fabric performance and any further relevant mitigation measures such as boundary fencing.

Liaison with LA

Liaison with LA (Name/Date)	Mark Moss - 20th March 2019
Principles Agreed	An assessment considering any mitigation required to achieve the identified target criteria set out in the draft condition, where necessary would be sufficient for the outline planning application. Mitigation measures may include fencing and/or boundary screening, along with outline specification of glazing and alternative means of ventilation. It was agreed that a full Professional Practice Guidance on Planning and Noise (ProPG) assessment was not strictly necessary in this instance, however demonstrating the themes of the ProPG guidance would be appropriate.

Check List	Page No(s)	Compliance		
		Y	N	N/A
Full site description/map provided	Page 3 & Attachment AS11113/SP1	X		
Site history provided	Page 3	X		
Current and potential future acoustic environment identified	Page 3, 4, 5, 6	X		
Identification of relevant legislative framework	Page 2, 3	X		
Conceptual model fully justified	All	X		
Inclusion of reporting elements of BS4142:2014 (Para 12 a to j)				X
Monitoring data fully representative	Page 4	X		
Raw data presented	Time histories AS11113/TM1-TM6	X		
ADS included (where ProPG relevant)	N/A as agreed			X
Calculations and assumptions fully presented and justified	Page 5, 6	X		
Uncertainty assessment provided	No BS4142 element			X
Clear recommendations and conclusions	Page 5, 6	X		
Executive summary included	Page 2	X		

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
Dan Saunders	Director	03/04/2019