

**Report VA6149.251114.NIA**

**Luckley House School, Wokingham**

**Noise Impact Assessment**

**21 November 2025**

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## Attachments

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| VA6149/SP1       | Indicative Site Plan               |
| VA6149/TH1 - TH5 | Environmental Noise Time Histories |
| VA6149/NM1 - NM5 | CADNA-A Noise Maps                 |
| Appendix A       | Acoustic Terminology               |

| Report Version | Author      | Approved      | Changes | Date       |
|----------------|-------------|---------------|---------|------------|
| NIA1           | Ollie Brunt | Ben Alexander |         | 21/11/2025 |

The interpretations and conclusions summarised in this report represent Venta Acoustics' best technical interpretation of the data available to us at the time of assessment. Any information provided by third parties and referred to in this report has not been checked or verified by Venta Acoustics, unless otherwise expressly stated in the document. Venta Acoustics cannot accept any liability for the correctness or validity of the information provided. Due to a degree of uncertainty inherent in the prediction of all parameters, we cannot, and do not guarantee the accuracy or correctness of any interpretation and we shall not, except in the case of gross or wilful negligence on our part, be liable for any loss, cost, damages or expenses incurred or sustained by anyone resulting from any interpretations, predictions of conclusions made by the company or employees. The findings and conclusions are relevant to the period of the site survey works, and should not be relied upon to represent site conditions at later dates. Where additional information becomes available which may affect the findings of our assessment, the author reserves the right to review the information, reassess the findings and modify the conclusions accordingly.

## 1. Introduction

As part of a redevelopment of the field at the southern end of the campus at Luckley House School, Wokingham, it is proposed to introduce two new rugby pitches, a cricket pitch and an athletics track to the site.

Venta Acoustics has been appointed to undertake a noise assessment of the proposal. This report evaluates the likely noise impact on the nearest noise-sensitive receptors and the surrounding environment. The assessment considers relevant guidance and the existing noise climate established through environmental noise monitoring.

## 2. Site Description

The site is located in a suburban setting near Wokingham, the site is currently an unused grass field. The site is bordered by residential properties to the west and at a greater distance to the northeast, the school itself to the north, fields to the south and the North Downs rail line to the east.

Dwellings along Hart Dyke Close (to the west) and Luckley Wood (to the northeast) are the nearest independent noise-sensitive dwellings to the pitch locations.

The proposal is to redevelop the western end of the field with a multi-use area, for different periods of the year. The sports pitches are multi-use but would be used for only one activity at a time, as such the predicted noise contribution from each sport will be modelled individually.

The pitches are intended for sports lessons and small scale matches, with the possibility of limited club or public use outside of school hours. There will be no grandstands or otherwise specific areas for spectators to watch matches and spectator attendance is expected to be very limited.

## 3. Design Criteria

### 3.1 Sport England

The Artificial Grass Pitch (AGP) Acoustics – Planning Implications – [Sport England 2015] document provides guidance for assessing noise from AGPs. While not directly applicable to rugby or cricket, the noise sources (shouting, ball impacts) share similarities. Key suggested criteria relevant to daytime use include:

- The noise level outside a residential property (approx. 1m from facades of living spaces) should not exceed 50 dB  $L_{Aeq,1hour}$ .
- Noise levels in gardens should not exceed 50 dB  $L_{Aeq,1hour}$ .
- Noise from the new facility should ideally not exceed the existing noise climate (measured in the  $L_{Aeq}$  parameter).

## 4. Environmental Noise Survey

### 4.1 Survey Procedure & Equipment

In order to establish the existing background noise levels at the site, a noise survey was carried out between Friday 7<sup>th</sup> and Tuesday 11<sup>th</sup> November 2025 at ground floor level at the location shown in site plan VA6149/SP1. This location was chosen to be representative of the noise levels at the surrounding residential elements.

Continuous 5-minute samples of the  $L_{Aeq}$ ,  $L_{Amax}$ ,  $L_{A10}$  and  $L_{A90}$  sound pressure levels were undertaken at the measurement location.

The weather during the survey period was generally dry with light winds. The background noise data is not considered to have been compromised by these conditions.

Higher noise levels briefly occurring at approximately 16:00 hours on Friday 7<sup>th</sup> November are spurious and have been excluded from further analysis.

Measurements were made generally in accordance with ISO 1996 2:2017 *Acoustics - Description, measurement and assessment of environmental noise – Part 2: Determination of sound pressure levels*.

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

| Manufacturer            | Model Type | Serial No | Calibration     |         |
|-------------------------|------------|-----------|-----------------|---------|
|                         |            |           | Certificate No. | Date    |
| Svantek Class 1 SLM     | 971A       | 143563    | 00002984-1      | 19/9/24 |
| Larson Davis calibrator | CAL200     | 13069     | 1511238-1       | 14/2/25 |

**Table 4.1 – Equipment used for the tests**

The calibration of the sound level meters was verified before and after use with no significant calibration drift observed.

### 4.2 Results

The measured sound levels are shown as time-history plots on the attached charts VA6149/TH1-5.

The site is primarily affected by distant traffic noise from the roads in the area.

The average noise levels for the Daytime, Night-time and Luckley House School operational hours, as measured at the automated monitoring position were:

| Monitoring Period                    | $L_{Aeq,T}$ | Typical <sup>1</sup> $L_{A90,5min}$ |
|--------------------------------------|-------------|-------------------------------------|
| 07:00 – 23:00                        | 47 dB       | 34 dB                               |
| 23:00 – 07:00                        | 39 dB       | 21 dB                               |
| LHS Operational hours: 08:30 – 17:30 | 48 dB       | 35 dB                               |

**Table 4.2 – Average ambient and typical background noise levels**

<sup>1</sup>The typical  $L_{A90}$  value is taken as the 10<sup>th</sup> percentile of all  $L_{A90}$  values measured during the relevant period.

The operational hours modal  $L_{Amax}$  noise levels at the site were determined to be in the order of 58dB.

## 5. Source Sound Levels

To determine source sound levels associated with cricket ball impacts, a survey was undertaken at another site over several days to capture representative sound levels during junior and senior players using cricket nets.

Observations were that the sound levels associated with the nets are modest, mainly from talk between players with the regular sound of ball strikes being heard as a dull sound above the general noise.

The typical  $L_{Amax}$  events from ball strikes were measured to be around  $L_{Amax}$  73dB at 20m, corresponding to the following sound power level:

| Frequency (Hz)          | 63 | 125 | 250 | 500 | 1k  | 2k  | 4k | 8k | dB(A) |
|-------------------------|----|-----|-----|-----|-----|-----|----|----|-------|
| Assumed $L_w$ $L_{max}$ | 97 | 96  | 99  | 99  | 105 | 101 | 91 | 86 | 107   |

**Table 5.1 – Derived sound power levels of cricket nets**

Average sound levels at around 25m from the batsman were around  $L_{Aeq}$  63 dB.

This data is considered representative of the expected noise levels from the proposed cricket square at Luckley House School.

In order to determine source noise levels for the rugby pitches, it is assumed that the dominant character of the noise will be voices from players, coaches and any (small number of) spectators in attendance at matches. As such reference levels from *ANSI 3.5:1997 - Methods for calculation of the speech intelligibility index* have been used for the assessment.

*ANSI 3.5:1997* refers to predefined voice levels. For rugby, it is assumed that the “Raised Voice” level is appropriate for players calling to one another and such events as previously outlined.

The *ANSI 3.5:1997* levels associated with a “Raised Voice” are as follows:

| Frequency (Hz)               | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | dB(A) |
|------------------------------|----|-----|-----|-----|----|----|----|----|-------|
| $L_{Aeq}$ @ 1m, Raised Voice | 50 | 56  | 62  | 67  | 62 | 57 | 51 | 43 | 67    |

**Table 5.2 – ANSI 3.5:1997 Raised Voice**

The data shown in Table 5.2 has been corrected to meet the Sport England AGP guidance for typical sports at 10m from the sideline at the halfway line of 58 dB  $L_{Aeq,1hour}$ . Such that a reasonable estimate of noise from the pitch can be used for the assessment.

Further to this, the following noise sources are generally associated with the use of sports pitches, with allocated source sound levels, to also be used in the assessment:

| Noise Source    | Measurement Distance | Source Sound Level | Data Reference                 |
|-----------------|----------------------|--------------------|--------------------------------|
| Shouted Voice   | 1m                   | 82 dB $L_{AFmax}$  | In-house Library               |
| Referee Whistle | 1m                   | 110 dB $L_{AFmax}$ | Literature Review <sup>1</sup> |

**Table 5.3 – Additional noise sources used in assessment**

Noise from the athletics track is not expected to be significant in the context of the cricket and rugby use and has not been specifically considered.

## 6. Recommended Mitigation Measures

To control noise, a barrier will need to be introduced at the eastern end of the rugby pitches between the pitches themselves and the rear of the noise sensitive receivers, in line with the “ball stop netting” on the proposed site layout drawings. This should be a 3.5 metre high screen, formed of a continuous and imperforate material with a minimum mass per unit area of 15kg/m<sup>2</sup>. The recommended location for such a screen is indicated on the attached site plan.

## 7. Sound Propagation Calculations

A 3D model of the proposed rugby pitches and cricket square has been constructed using the CADNA-A noise modelling software to understand the transmission from the pitches in accordance with ISO 9613-2 (2024), with the specified mitigation measure implemented. The model incorporated the derived source sound power levels (Section 5), the ground absorption was set to 0.5.

The calculations indicate the following sound pressure levels at ground floor (due to daytime usage) level at the assessment locations:

| Assessment Location          | Predicted Sound Levels (Ground Floor) |            |                     |            |
|------------------------------|---------------------------------------|------------|---------------------|------------|
|                              | Rugby Pitches Only                    |            | Cricket Square Only |            |
|                              | $L_{Aeq,1hour}$                       | $L_{Amax}$ | $L_{Aeq,1hour}$     | $L_{Amax}$ |
| Dwellings on Hart Dyke Close | 50 dB                                 | 68 dB      | 47 dB               | 58 dB      |
| Dwellings on Luckley Wood    | 43 dB                                 | 63 dB      | 42 dB               | 51 dB      |

**Table 7.1 – Predicted sound levels from rugby pitches and cricket square**

<sup>1</sup> There is a wide range of noise data available for referees’ whistles, ranging from 90dB(A) to 120dB(A), depending on the type and how hard the whistle is blown. The noise level at the receptors will also depend on the location and orientation of the referee when the whistle is blown. The value of 110 dB(A) is selected as a reasonable value for a school sports field.

## 8. Discussion

The assessment evaluates the potential impact by comparing the predicted noise levels (Table 7.1) against the existing noise climate (Table 4.2) and relevant criteria (Section 3). The facilities are assumed to be used during the day.

### 8.1 Sports Noise Levels at Dwellings

With the aforementioned mitigation measures implemented, the following predictions of impact can be made:

**Average Levels ( $L_{Aeq}$ ):** With reference to noise map, VA6149/NM1, the average sound level of the rugby pitches in use is predicted to be in the range  $L_{Aeq,1hour}$  46 – 50 dB at the most exposed ground floor windows and gardens of the dwellings along Hart Dyke Close.

For the cricket pitch, VA6149/NM2-NM3 indicates that the average sound level of the pitch in use is in the range  $L_{Aeq,1hour}$  45 - 48dB<sup>2</sup> at the most exposed ground floor windows and gardens of the dwellings along Hart Dyke Close.

These predictions meet the guideline set by Sport England of  $L_{Aeq,1hour} \leq 50$  dB.

The predicted levels are commensurate with the existing prevailing noise climate experienced at receivers during the operational hours of the school.

#### Maximum Sound Levels:

Sports England does not include consideration of maximum noise event levels but maxima are nonetheless reported to provide a more complete picture of noise associated with the proposed pitches.

The typical maximum events expected outside most affected facades of nearby receivers resulting from the use of the cricket pitch (VA6149/NM4) are equal to the existing daytime modal  $L_{AFmax}$  noise levels (58 dB) at the site. Maxima due to rugby play would be higher at around  $L_{AFmax}$  68 dB (VA6149/NM5) due to the nature of the whistle and shouting from players on the pitches.

### 8.2 Operational Context

The context of the area is one in which sports fields form a part of the established character, due to existing football and hockey pitches in the vicinity of the newly proposed facilities.

Sports noise levels are predicted to be generally commensurate with the existing residual noise climate at the receivers. Whilst rugby noise maxima could be slightly higher than existing levels at some receivers on Hart Dyke Close, the proposed new pitches would not be expected to change the existing noise character significantly.

<sup>2</sup> This is the predicted level with the batter at the western end of the wicket

This context supports a finding of a low impact from the proposals, commensurate with the LOAEL.

## 9. Noise Management Plan

While a low impact is expected, the following management plan could be refined and adopted to aid in maintaining a good relationship with neighbours:

- Staff, Students and Spectators should be reminded of the proximity to residents through the use of signs and information when using the facilities.
- While it is natural that students/staff/spectators would be enthusiastic during training and matches, the use of the facilities should be subject to reasonable and responsible behaviour. This should include keeping shouting to a minimum and a zero tolerance policy for bad language.
- Music will not be permitted to be played on or around the facilities.
- The staff will actively and intentionally listen out for unnecessary shouting and provide verbal reminders/warning immediately.
- A phone number will be provided to residents to report any such behaviour and the school will undertake to deal with complaints in a timely and professional fashion.
- If students/staff/spectators were to continually disregard these policies, the school will raise this issue with the person/people in question.

## 10. Conclusion

A noise assessment has been undertaken for proposed rugby pitches, cricket square and athletics track to be located at Luckley House School, Wokingham.

An environmental noise survey established the existing noise levels in the area, characterised by moderate traffic noise from the surrounding roads.

Source noise levels for rugby were derived from standard “Raised Voice” levels taken from appropriate literature for human voices. Noise from typical use of cricket nets was measured at a another site, with the results from this used to make an informed prediction of the expected noise from the proposed cricket pitch.

This allowed noise levels to be predicted at the nearest noise-sensitive dwellings on Hart Dyke Close and at a greater distance, Luckley Wood.

At these residences on these roads, predicted highest levels ( $L_{A\text{Max}}$  68 dB) are greater than the existing noise climate. However due to the nature of the limited usage of the pitches, the impact at the most affected noise sensitive receivers is expected to be low.

The assessment relies on the facilities being constructed as specified, with a necessary mitigation measure implemented and reasonable and responsible use of the facilities, as outlined in a suggested Noise Management Plan.

Based on the findings and the context of the area with existing playing fields and outdoor sports facilities, the assessment concludes that the proposed facilities can operate without causing a significant adverse noise impact on nearby residents.

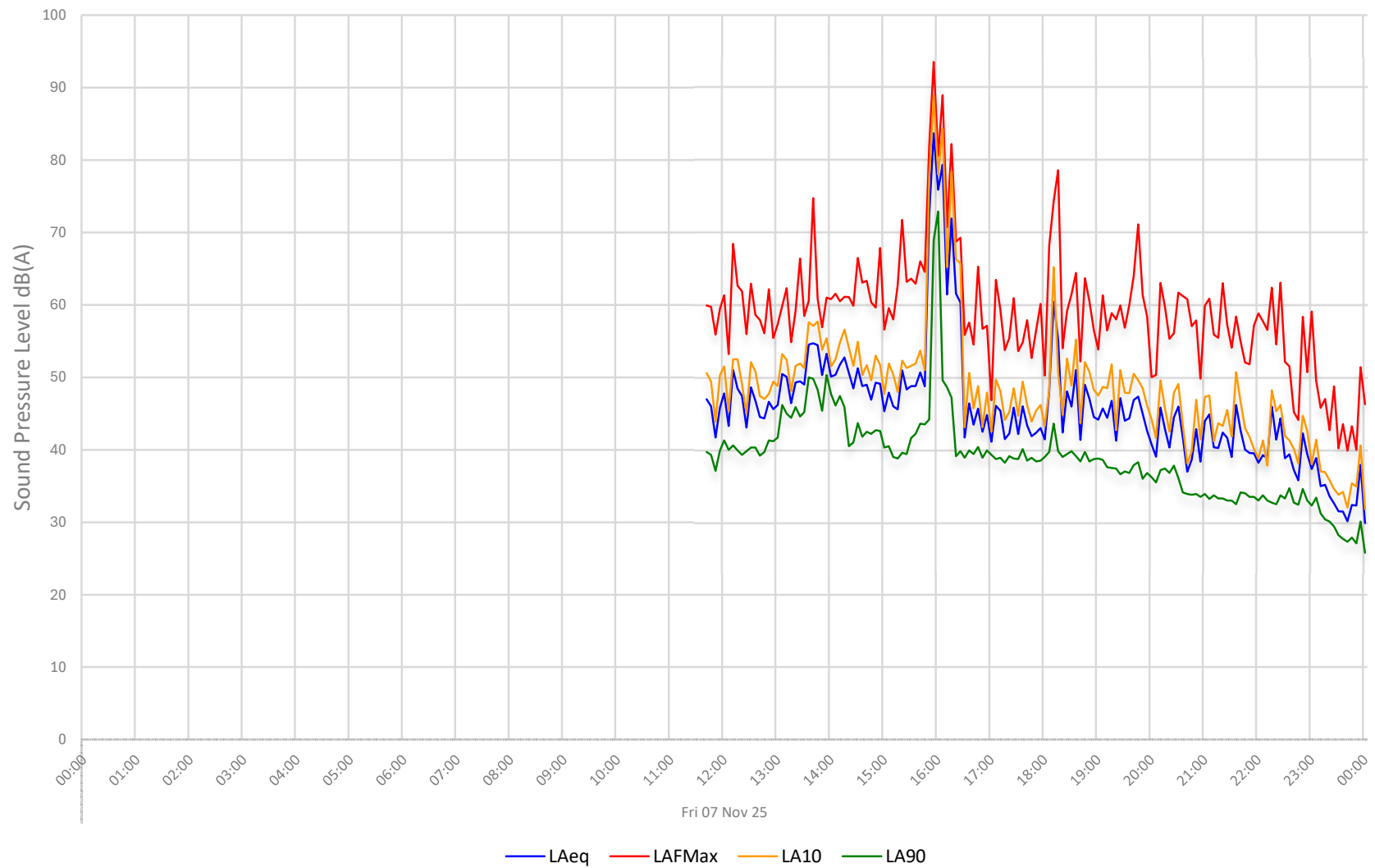
**Ollie Brunt**



Luckley House School, Wokingham  
Environmental Noise Time History: 1



Figure VA6149/TH1



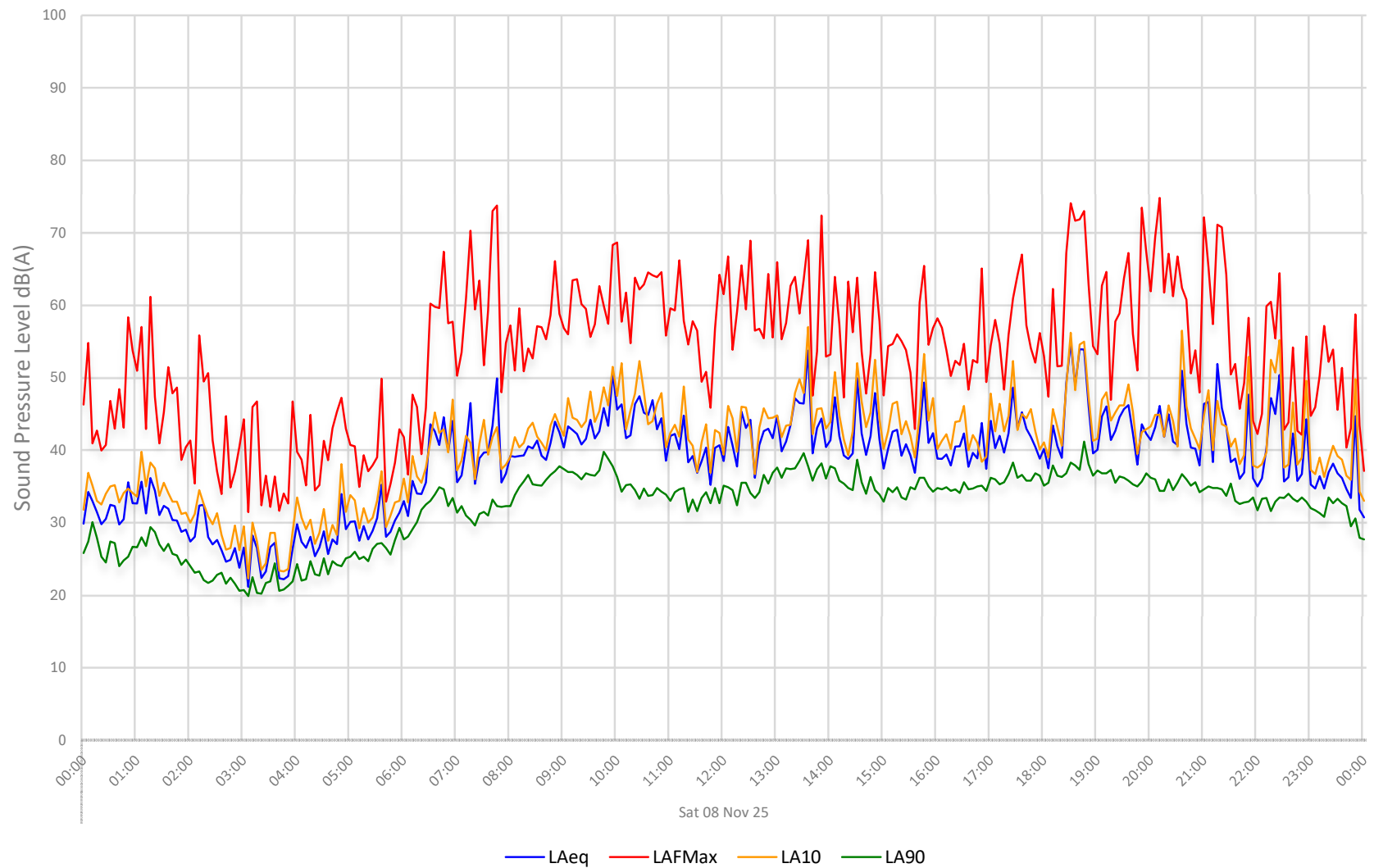
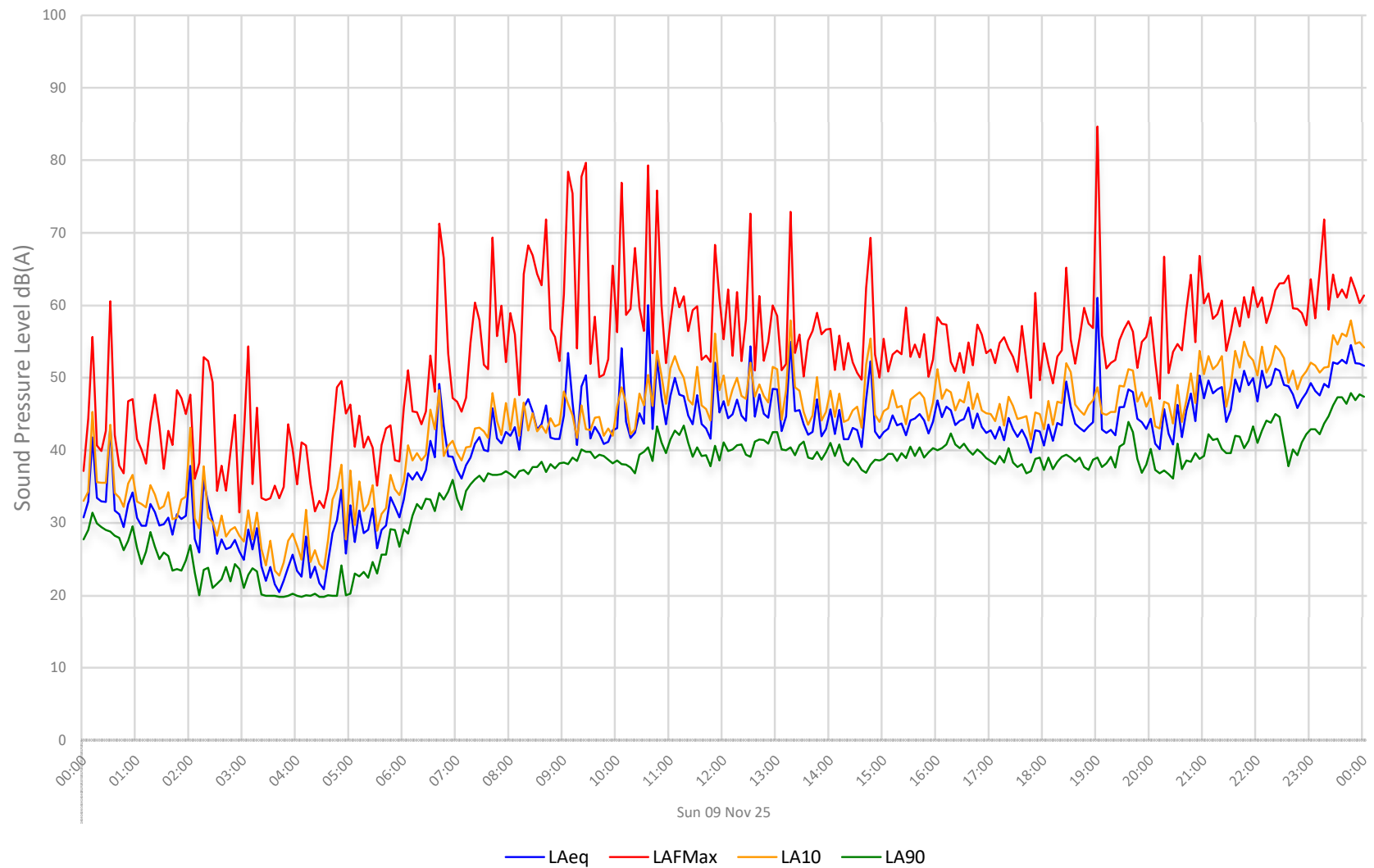


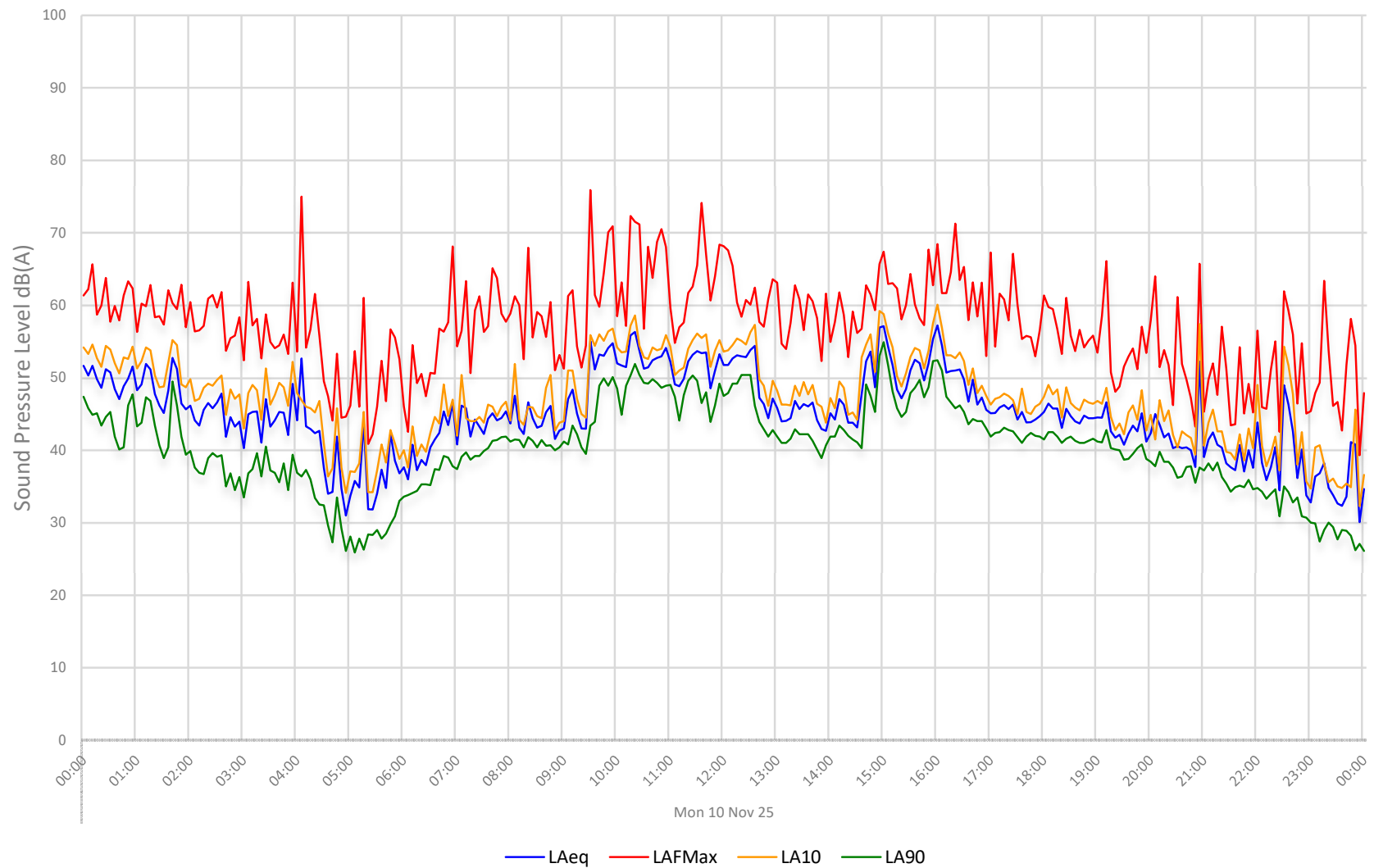
Figure VA6149/TH3



Luckley House School, Wokingham  
Environmental Noise Time History: 4



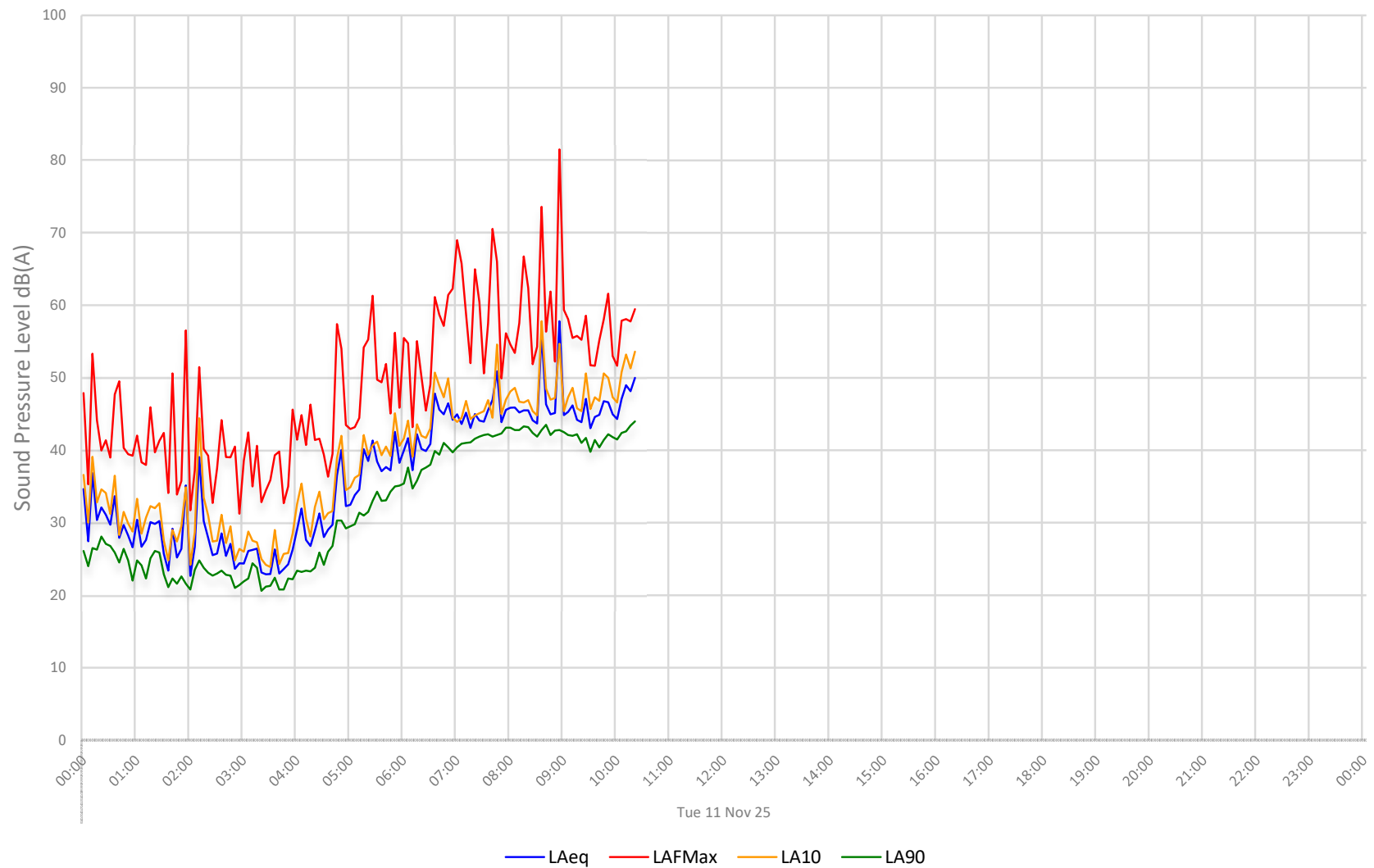
Figure VA6149/TH4



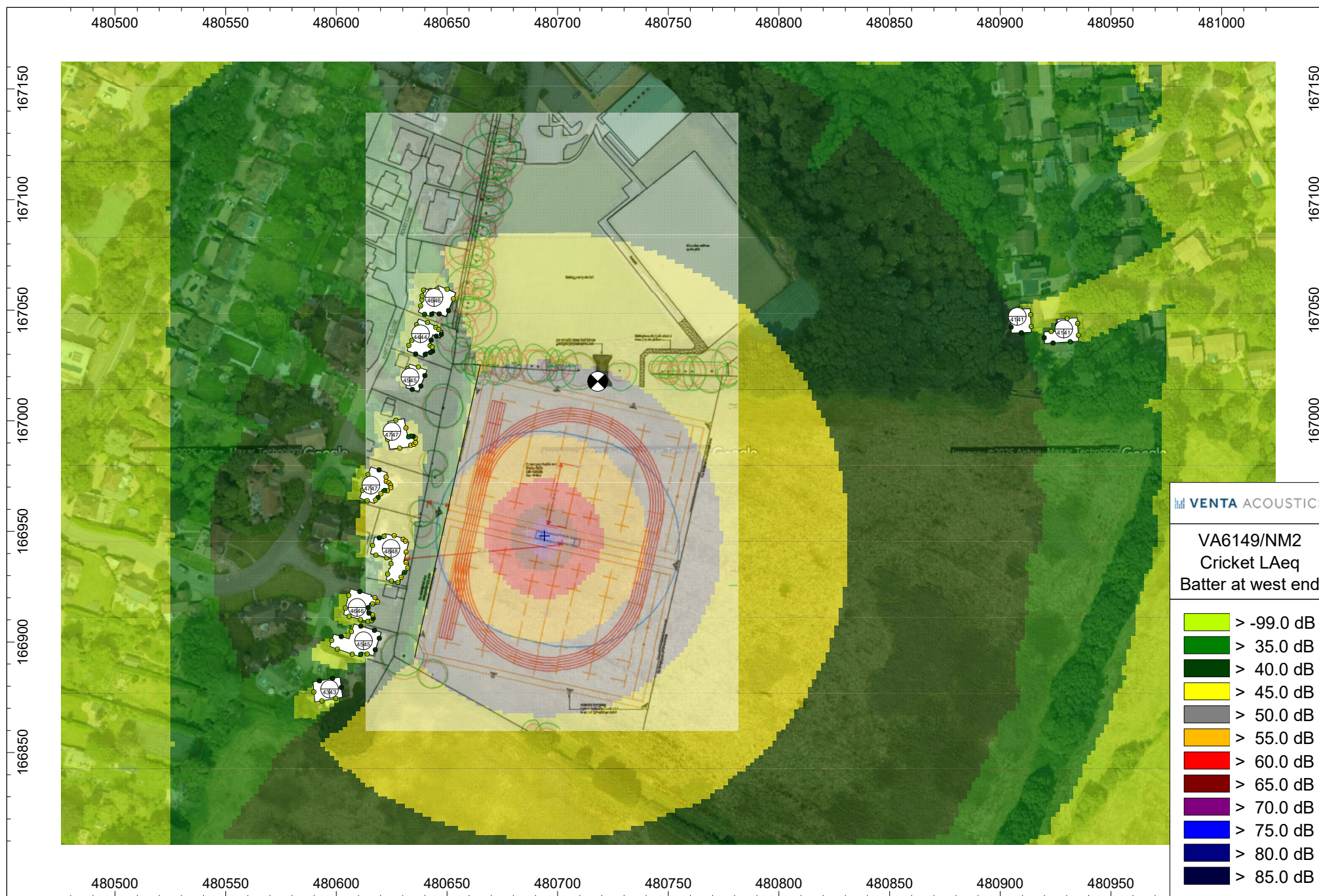
Luckley House School, Wokingham  
Environmental Noise Time History: 5

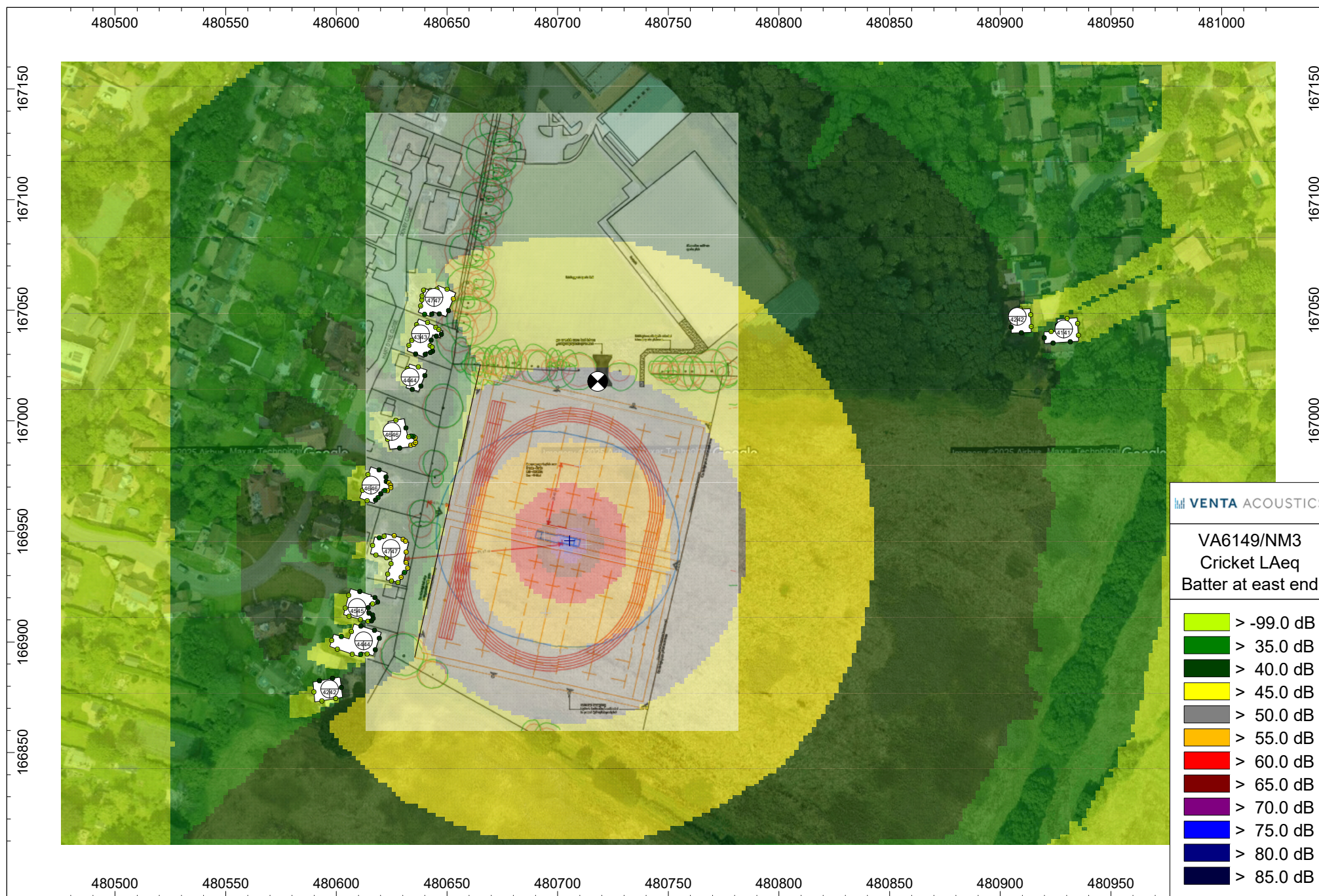


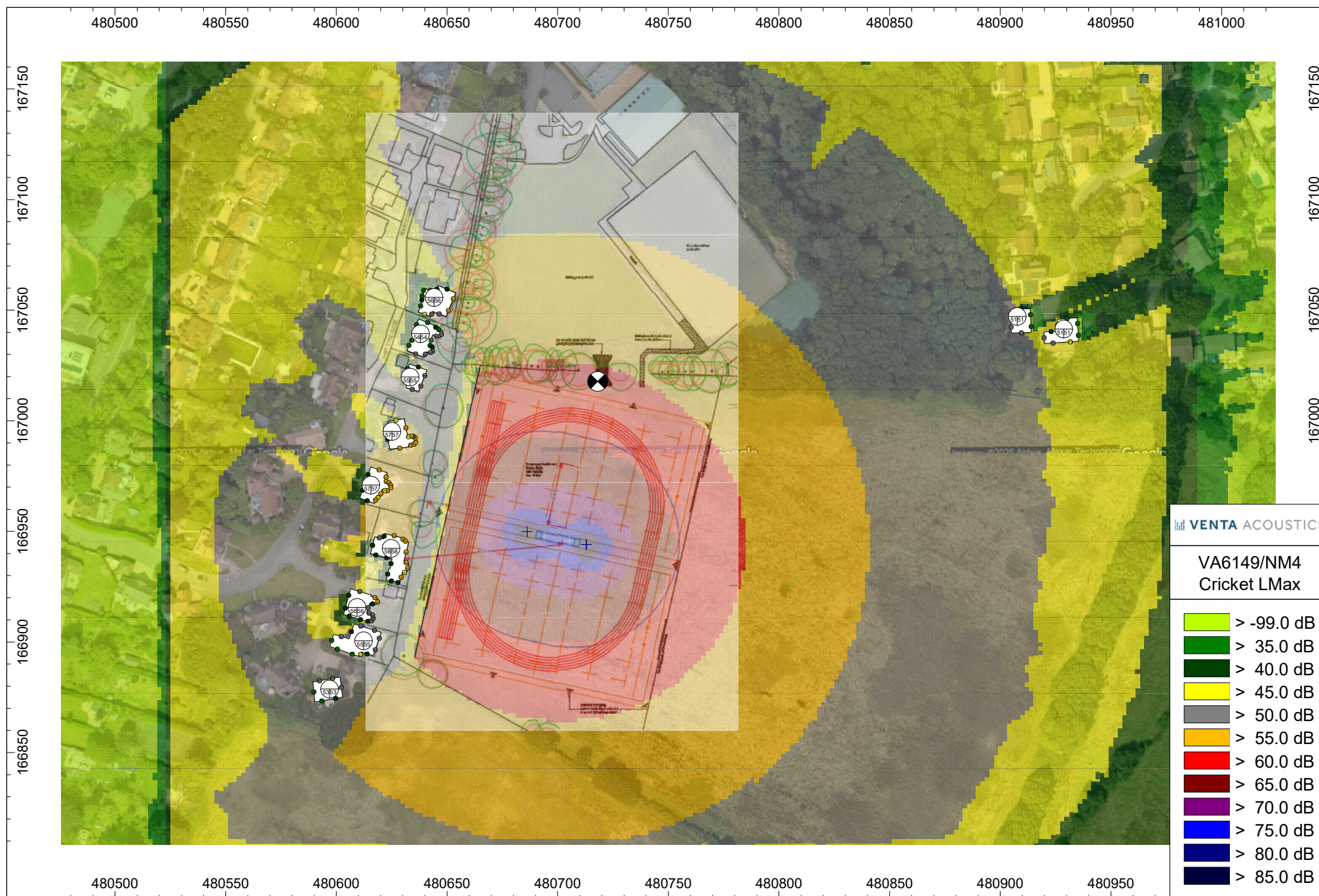
Figure VA6149/TH5

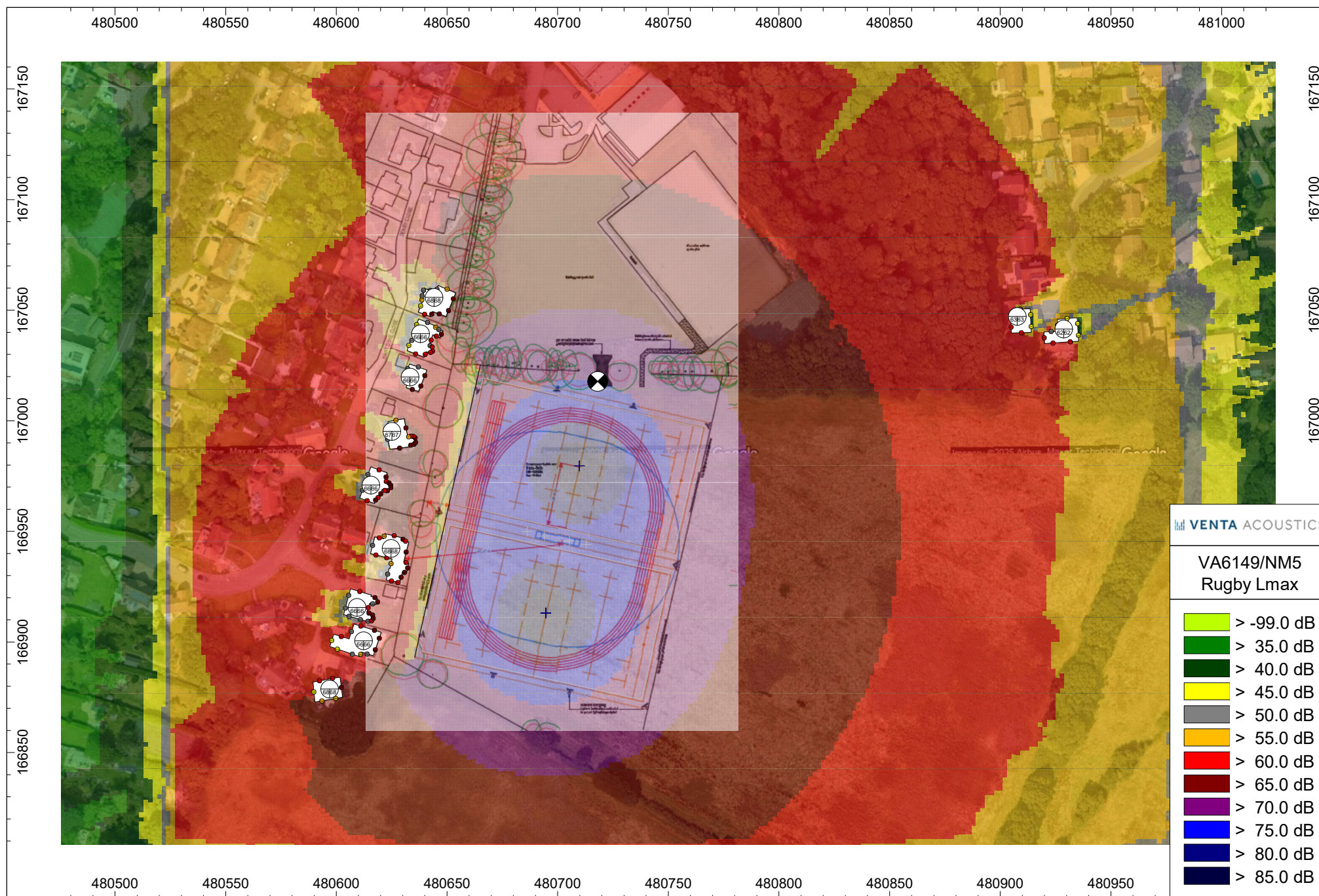












# APPENDIX A

## 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.

|                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sound</b>                                           | Vibrations propagating through a medium (air, water, etc.) that are detectable by the auditory system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Noise</b>                                           | Sound that is unwanted by or disturbing to the perceiver.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Frequency</b>                                       | 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'.                                                                                                                                                                                                                                           |
| <b>dB(A):</b>                                          | 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 $L_A$ .<br>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).        |
| <b><math>L_{eq}</math> :</b>                           | 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.<br><br>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.                                                                                  |
| <b><math>L_{10}</math> &amp; <math>L_{90}</math> :</b> | 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.<br>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. |
| <b><math>L_{max}</math> :</b>                          | 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.                                                                                                                                                                                                                                                                                                                                                                |
| <b>R</b>                                               | <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.                                                                                                                                                                                                                                                                                                  |
| <b>D</b>                                               | 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.                                                                                                                                                                                             |
| <b><math>D_{nT}</math></b>                             | <i>Weighted Standardised Level Difference.</i> As defined in BS EN ISO 717-1, representing the <i>Weighted Level Difference</i> , when standardised for reference receiving room reverberant characteristics.                                                                                                                                                                                                                                                                                                                                                                                               |
| <b><math>D_{n,e}</math></b>                            | 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.                                                                                                                                                                                                                                                                                                                                                                                           |
| <b><math>D_{n,f}</math></b>                            | 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                                                                                                                                                                                                                                                                                                                                                                                                           |

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## Acoustic Terminology & Human Response to Broadband Sound

|                                    |                                                                                                                                                                                                                                                                                                             |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| $R_w D_w$                          | 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.                                                                                                                                                      |
| $D_{nT,w}$ $D_{n,e,w}$ $D_{n,f,w}$ |                                                                                                                                                                                                                                                                                                             |
| $C, C_{tr}$                        | Spectral adaptation terms to be added to a single number quantity such as $D_{nT,w}$ , to take account of the sound insulation within frequency ranges of particular interest.                                                                                                                              |
| $L'_{nT,w}$                        | <i>Weighted Standardised Impact Sound Pressure Level</i> as defined in BS EN ISO 717-2, representing the level of sound pressure when measured within a space where the floor above is under excitation from a calibrated tapping machine, standardised for the receiving room reverberant characteristics. |
| $\Delta L_w$                       | Change in impact sound pressure level when a floor is fitted with a 'soft' or resilient covering, as measured in an accredited laboratory test suite in accordance with the procedures laid down in BS EN ISO 10140-3:2010.                                                                                 |

### 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

### 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.

| 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

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## Acoustic Terminology & Human Response to Broadband Sound

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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.