

**Report VA5551.260527.NIA4.1**

**Broadway Farm, Broad Oak, Botley**

Noise Impact Assessment

**27 May 2026**

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| Report Version | Author       | Approved      | Changes          | Date    |
|----------------|--------------|---------------|------------------|---------|
| NIA4           | Jamie Duncan | Ben Alexander | -                | 22/5/26 |
| NIA4.1         | Jamie Duncan | Ben Alexander | Minor amendments | 27/5/26 |

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

CCW Services operates a warehouse, storage and transport service, with a fleet of 25 HGVs that service the site at Broadway Farm, Broad Oak 24/7, and have done so for a number of years.

The Applicant intends to construct two new docked, same level loading bays to the most southeastern warehouse on the site, with HGVs reversing up to the docked loading bays, before being loaded using palette trucks inside the trailer body.

As part of this, the southern parking area of the site will be used by the HGVs to reverse up to the warehouse, and then drive out the existing access to the southwest of the parking area.

Venta Acoustics has been commissioned by CCW Services Ltd to undertake an assessment of the potential noise impact of these changes on the nearby noise sensitive receivers.

An environmental noise survey was undertaken to determine the background noise levels at the site, as well as the sound levels generated by the surrounding premises. These levels were then used to undertake an assessment of the likely impact with reference to the methodology in BS4142:2014 *Methods for rating and assessing industrial and commercial sound*. This report also compares the measured levels with the aims and intents of the National Planning Policy Framework (2024), Noise Policy Statement for England (2010), Planning Policy Guidance, BS8233: 2014 *Guidance on sound insulation and noise reduction for buildings* and the World Health Organisation Guidelines for Community Noise (1999).

All staff at Venta Acoustics are fully qualified and members of the Institute of Acoustics, the recognised UK professional body for acoustics, noise and vibration professionals and are fully competent to undertake BS4142 assessments.

## 2. Site Description

As illustrated on attached site plan VA5551/SP1, the site is located to the north of Broad Oak, a main access road running between Hedge End and Botley. The site is bordered by agricultural land to the west, north and east.

The most affected noise sensitive receivers not linked to the site are expected to be located at Spring Cottage to the southwest, and Brook Cottages to the southeast.

On site, there is Broadway Farm house which is linked to the scheme, but will also be included in assessment for the sake of completeness.

### 3. Design Criterion and Assessment Methodology

#### 3.1 BS4142:2014+A1:2019

British Standard BS4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* describes a method for rating and assessing sound of an industrial and/or commercial nature, which includes:

- Sound from industrial and manufacturing processes;
- Sound from fixed installations which comprise mechanical and electrical plant and equipment;
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises, and;
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes.

The Standard is therefore suited to this assessment.

The assessment methodology considers the Specific Sound Level, as measured or calculated at a potential noise sensitive receptor, due to the source under investigation in terms of a  $L_{Aeq}$  value over a one-hour period during daytime operation (07:00-23:00 hours) and a fifteen-minute period during night-time operation (23:00-07:00 hours).

A correction factor is added to this level to account for the acoustic character of the sound. This is determined as follows when using the subjective assessment methodology:

**Tonality** - For sound ranging from not tonal to prominently tonal, the Joint Nordic Method gives a correction of between 0 dB and +6 dB for tonality. Subjectively, this can be allocated as a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible and 6 dB where it is highly perceptible.

**Impulsivity** - A correction of up to +9dB can be applied for sound that is highly impulsive considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be allocated as a penalty of 3 dB for impulsivity which is just perceptible at the receiver, 6 dB where it is clearly perceptible and 9 dB where it is highly perceptible.

**Other sound characteristics** - Where the specific sound contains characteristics that are neither tonal nor impulsive, but are otherwise startling, disturbing or incongruous with the residual acoustic environment, a penalty of +3 dB can be applied.

**Intermittency** - When the specific sound has identifiable on/off conditions, if the intermittency is readily distinctive against the residual acoustic environment, a penalty of +3 dB can be applied.

An initial estimate of the impact of the source is then obtained by subtracting the typical background noise level, in terms of a  $L_{A90}$  value over the relevant period of operation, from the corrected Specific Sound Level.

- Typically, the greater this difference, the greater the magnitude of the impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB could be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that there will be an adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound having a low impact, depending on the context.

The initial estimate of the impact may then be modified by taking consideration of the context in which the sound occurs.

### 3.2 The National Planning Policy Framework (2024)

The revised *National Planning Policy Framework* (NPPF), published in December 2024 (amended in February 2025), sets out the Government's planning policies for England, superseding all previous planning policy statements and guidance.

In respect of noise, the NPPF states that the planning system should contribute to and enhance the natural and local environment by preventing both new and existing developments from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of noise pollution.

Hence, Paragraph 198 states that *planning policies and decisions should also ensure 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*

In regards to the term adverse impact, reference is made to the Noise Policy for England:

### 3.3 Noise Policy Statement for England (2010)

The Noise Policy Statement for England (NPSE) sets out the long term vision of Government noise policy: to promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

This vision is supported by the following aims:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life.*

The terms “significant adverse” and “adverse” are related to the following concepts:

No Observed Effect Level (NOEL) - *the level below which no effect on health and quality of life can be detected.*

Lowest Observed Adverse Effect Level (LOAEL) - *the level above which adverse effects on health and quality of life can be detected.*

Significant Observed Adverse Effect Level (SOAEL) - *the level above which significant adverse effects on health and quality of life occur.*

The guidance acknowledges that 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, but will be different for different noise sources, receptors and times.

In order to enable assessment of impacts in line with these requirements, reference should be made to other currently available guidance.

### 3.4 Planning Practice Guidance

This document advises on how planning can be used to manage potential noise impacts on communities.

The document has some overlap with the NPSE in its guidance although it does introduce new concepts regarding amenity.

Local planning authorities’ plan-making and decision taking should take account of the acoustic environment and in doing so consider:

- *whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved.*

The document includes a table, reproduced in Table 3.1, regarding perception of noise in relation to the effect on residents, which is summarised below. This provides a qualitative description of noise and how it affects people and their behaviour.

| Perception                     | Examples of outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Increasing effect level                   | Action                           |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|----------------------------------|
| Not noticeable                 | No Effect                                                                                                                                                                                                                                                                                                                                                                                                                                                            | No Observed Effect                        | No specific measures required    |
| Noticeable and not intrusive   | Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.                                                                                                                                                                                                                                                             | No Observed Adverse Effect                | No specific measures required    |
|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Lowest Observed Adverse Effect Level      |                                  |
| Noticeable and intrusive       | Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.                                                          | Observed Adverse Effect                   | Mitigate and reduce to a minimum |
|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Significant Observed Adverse Effect Level |                                  |
| Noticeable and disruptive      | The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area. | Significant Observed Adverse Effect       | Avoid                            |
| Noticeable and very disruptive | Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory                                                                                                                                                                               | Unacceptable Adverse Effect               | Prevent                          |

**Table 3.1 – Noise exposure hierarchy**

### 3.5 BS8233:2014

BS8233 *Guidance on sound insulation and noise reduction for buildings* provides guidance as to suitable internal noise levels for different areas within residential buildings.

The relevant section of the standard is shown below in Table 3.2.

| Activity                   | Location    | 07:00 to 23:00            | 23:00 to 07:00           |
|----------------------------|-------------|---------------------------|--------------------------|
| Resting                    | Living Room | 35 dB $L_{Aeq}$ , 16 hour | -                        |
| Dining                     | Dining Room | 40 dB $L_{Aeq}$ , 16 hour | -                        |
| Sleeping (daytime resting) | Bedroom     | 35 dB $L_{Aeq}$ , 16 hour | 30 dB $L_{Aeq}$ , 8 hour |

**Table 3.2 – Excerpt from BS8233: 2014**

[dB ref. 20μPa]

## 3.6 WHO Guidelines for Community Noise (1999)

The guidance in this document details suitable noise levels for various activities within residential and commercial buildings.

The relevant sections of this document are shown in Table 3.3.

| Criterion                                                                         | Environment | Design range $L_{Aeq,T}$ dB |
|-----------------------------------------------------------------------------------|-------------|-----------------------------|
| Maintain speech intelligibility and avoid moderate annoyance, daytime and evening | Living Room | 35 dB                       |
| Prevent sleep disturbance, night time                                             | Bedrooms    | 30 dB                       |

**Table 3.3 – Excerpt from WHO**

[dB ref. 20μPa]

For outdoor living areas, it is stated that:

*To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55dB  $L_{Aeq}$  on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50dB  $L_{Aeq}$ . Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development.*

## 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 Thursday 19<sup>th</sup> and Monday 23<sup>rd</sup> September 2024 at the locations shown in site plan VA5551/SP1. These locations were chosen to be representative of the background noise level at the most affected noise sensitive receivers.

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

The weather during the survey period was generally dry with light winds, with some periods of rain, that have been excluded from the 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    |
| NTi Class 1 Integrating SLM | XL2        | A2A-11461-E0 | 1509201-1       | 19/7/24 |
| NTi Class 1 Integrating SLM | XL2        | A2A-11586-E0 | 1509201-2       | 19/7/24 |
| Svante Class 1 SLM          | 971        | 143568       | 1508506-1       | 22/4/24 |
| Larson Davis calibrator     | CAL200     | 19816        | 1509201-5       | 19/7/24 |

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

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

## 5. Results

The measured sound levels are shown as time-history plots on the attached charts VA5551/TH1-4 for position 1, VA5551/TH5-6 for position 2 and VA5551/TH7-10 for position 3.

The background noise level is determined by traffic on the roads in the local area.

The typical background noise levels measured were:

| Monitoring Period   | Typical <sup>1</sup> L <sub>A90,5min</sub> |                   |                       |
|---------------------|--------------------------------------------|-------------------|-----------------------|
|                     | Position 1 (West)                          | Position 2 (East) | Position 3 (Entrance) |
| 07:00 – 23:00 hours | 39 dB                                      | 39 dB             | 44 dB                 |
| 23:00 – 07:00 hours | 25 dB                                      | 26 dB             | 32 dB                 |

**Table 5.1 – Typical background noise levels**

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

## 6. BS4142 Noise Impact Assessment

### 6.1 Source Noise Levels

Although the business does not always operate 24/7, there are occasions when there may be HGV movements during the night-time, and so an evaluation of noise from the southern area, and unloading areas has been undertaken to the most affected dwelling off site, as well as the on-site receiver.

Noise from HGVs entering and leaving site along the access road would be unchanged from the current situation, and so this has not been evaluated.

The following source noise level has been used for the purpose of the assessment.

| Noise Source                  | Measurement Distance | L <sub>Aeq</sub> |
|-------------------------------|----------------------|------------------|
| HGV manoeuvring               | 8m                   | 73 dB            |
| Unloading within trailer body | 10m                  | 63 dB            |

**Table 6.1 – Measured and library data noise sources used for assessment**

## 6.2 Acoustic Character Correction

The subjective method of allocating corrections to the sound source has been used following the methodology provided in BS4142:2014 and summarised in section 3.1.

It is understood that the tonal reversing alarms will be turned off on the HGVs and instead a visual flashing alert utilised during the night-time periods on site. This would remove both the penalties for both tonality and impulsivity from the assessment that would traditionally be associated with HGV manoeuvres.

| Noise Source                     | Subjective Description                                                         | Allocated Corrections                                    |
|----------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------|
| HGV Manoeuvring                  | Intermittent deliveries, diesel engine broadband                               | Tonality: 0dB<br>Impulsivity: 0dB<br>Intermittency: +3dB |
| Unloading/loading within trailer | Intermittent in occurrence, not expected to be tonal or impulsive at receivers | Tonality: 0dB<br>Impulsivity: 0dB<br>Intermittency: +3dB |

**Table 6.2 – Acoustic character corrections**

These penalties are applied to the specific noise level in section 6.4 to obtain the rating level.

## 6.3 Proposed Mitigation Measures

As part of the works, it is intended to install a 3m high solid fence (minimum mass 14kg/m<sup>2</sup>) to the south, east, and west of the southern parking area to reduce impact on the nearby receivers.

## 6.4 Rating Level and Assessment

Due to the complexity of the building interaction in this locale and the likelihood of noise both reflecting off and being screened by the surrounding buildings, 3D noise mapping using DataKustik CadnaA software was implemented to ensure the most accurate prediction of plant noise levels at the nearest noise sensitive receivers.

This process uses several different calculation protocols to derive accurate noise analysis predictions. Noise propagation and barrier attenuation are calculated in accordance with ISO 9613-1:1993 *Acoustics - Attenuation of sound during propagation outdoors - Part 1: Calculation of the absorption of sound by the atmosphere* and ISO 9613-2:2024 *Attenuation of sound during propagation outdoors - Part 2: Engineering method for the prediction of sound pressure levels outdoors*.

The local topography has been imported into the model from the DEFRA Lidar digital terrain model to account for the various levels across the site. The model has been set to allow for three reflections off all surfaces, and suitable finishes allowed for the buildings.

A moving source has been modelled, with the HGV driving into the storage area, manoeuvring back and forwards to reverse up to the loading dock prior to unloading, with movement lines of the HGV source shown on the attached noise map, ref. VA5551/NM1.

All loading would be undertaken within the body of the trailer, with no external loading carried out in this location.

### 6.4.1 Off-Site Receivers

Springtime Cottage to the southwest would be the most affected dwelling off-site from the HGV movements.

| Results                                      |                        | Relevant Clause | Commentary                    |
|----------------------------------------------|------------------------|-----------------|-------------------------------|
| Specific Sound Level                         | L <sub>Aeq</sub> 34 dB |                 | As calculated in VA5551/NM1   |
| Time correction                              | -12 dB                 | 7.2             | 1 minute per 15 minute period |
| Acoustic feature correction                  | +3 dB                  | 9.2             | +3dB for intermittency        |
| Rating level                                 | L <sub>Ar</sub> 25 dB  | 9.2             |                               |
| Night-time background sound level            | L <sub>A90</sub> 25 dB | 8               |                               |
| Excess of rating over background sound level | 0 dB                   | 11              |                               |
| Assessment indicates low impact              |                        | 11              | Depending on context          |

**Table 6.3 – BS4142 Assessment – HGV movements**

Brook Cottages, to the south east by the Richmond car dealership is the most affected receiver from unloading/loading.

| Results                                      |                        | Relevant Clause | Commentary                       |
|----------------------------------------------|------------------------|-----------------|----------------------------------|
| Specific Sound Level                         | L <sub>Aeq</sub> 21 dB |                 | As calculated in VA5551/NM2      |
| Time correction                              | 0 dB                   | 7.2             | Constant during 15 minute period |
| Acoustic feature correction                  | +3 dB                  | 9.2             | +3dB for intermittency           |
| Rating level                                 | L <sub>Ar</sub> 24 dB  | 9.2             |                                  |
| Night-time background sound level            | L <sub>A90</sub> 25 dB | 8               |                                  |
| Excess of rating over background sound level | -1 dB                  | 11              |                                  |
| Assessment indicates low impact              |                        | 11              | Depending on context             |

**Table 6.4 – BS4142 Assessment – Loading/unloading**

The above indicates that there would be a low impact from the proposals on the off-site receivers.

### 6.4.2 On-Site Receiver

Broadway Farm house is financially linked to the site, and is located to the west of the application area.

| Results                                      |                        | Relevant Clause | Commentary                    |
|----------------------------------------------|------------------------|-----------------|-------------------------------|
| Specific Sound Level                         | L <sub>Aeq</sub> 34 dB |                 | As calculated in VA5551/NM1   |
| Time correction                              | -12 dB                 | 7.2             | 1 minute per 15 minute period |
| Acoustic feature correction                  | +3 dB                  | 9.2             | +3dB for intermittency        |
| Rating level                                 | L <sub>Ar</sub> 25 dB  | 9.2             |                               |
| Night-time background sound level            | L <sub>A90</sub> 25 dB | 8               |                               |
| Excess of rating over background sound level | 0 dB                   | 11              |                               |
| Assessment indicates low impact              |                        | 11              | Depending on context          |

**Table 6.5 – BS4142 Assessment – HGV movements**

| Results                                      |                        | Relevant Clause | Commentary                       |
|----------------------------------------------|------------------------|-----------------|----------------------------------|
| Specific Sound Level                         | L <sub>Aeq</sub> 24 dB |                 | As calculated in VA5551/NM2      |
| Time correction                              | 0 dB                   | 7.2             | Constant during 15 minute period |
| Acoustic feature correction                  | +3 dB                  | 9.2             | +3dB for intermittency           |
| Rating level                                 | L <sub>Ar</sub> 27 dB  | 9.2             |                                  |
| Night-time background sound level            | L <sub>A90</sub> 25 dB | 8               |                                  |
| Excess of rating over background sound level | +2 dB                  | 11              |                                  |
| Assessment indicates marginal impact         |                        | 11              | Depending on context             |

**Table 6.6 – BS4142 Assessment – Loading/unloading**

The above indicate that there would be a low to marginal impact from the proposals on the financially linked property.

## 6.5 Context

The site has a long history of use as a 24 hour business with regular HGV movements, and is not understood to have generated any complaints. Due to the predicted absolute noise levels externally being low, and the busy nature of the main road, this may support the lack of complaints.

The on-site dwelling is owned by the operator's family and has been used in this way for a long time, with HGV movements occurring closer to the property on the access road than the proposed new activities.

At a greater distance, there is the busy main road, and various businesses, including a fuel station and a septic tank company to the west, and vehicle sales premises to the east.

Within this context, the estimated impact of the sound sources is expected to remain valid or be slightly reduced.

## 6.6 Uncertainty

This section considers the variable in the assessment that may cause variations within the final results and describes how these have been addressed.

- Use of a Class 1 sound level meter is considered to reduce instrument error to insignificant levels as compared with environmental variations. The calibration of the instrumentation was confirmed before and after the noise surveys.
- The background measurements were undertaken under suitable weather conditions over a period designed to include reasonable temporal variations in background noise levels, including a weekend period. Multiple monitoring locations were selected to minimise local acoustic phenomenon that may affect a single measurement location, including the noise from the nearby road site. These measurement locations were selected to be representative of the background noise levels expected to be experienced by the nearby dwellings without being unduly influenced by extraneous noise sources.
- Propagation calculations have been used to correct noise levels to the relevant distance at the receiver.

Overall, the uncertainty is considered to have been minimised to a suitable range so as not to risk significant variations in the impact assessment of typical operations.

## 6.7 NPPF, NPSE, PPG and WHO

The NPPF highlights that consideration should be taken for a location taking into account the likely effects of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site. It goes on to state, as is echoed in the NPSE and the PPG, that where possible, measures should be taken to mitigate and reduce to a minimum potential adverse impacts.

As previously discussed, the site has a long history of commercial use throughout the day and night.

The BS4142 assessment suggests the potential for a low impact on the offsite dwellings during the night-time, with a marginal impact on the on-site dwelling.

However, this is based on the quietest periods of the night when noise levels are at their lowest. At this time, it is considered unlikely that the residents would experience the noise in their rear gardens, and instead be more likely to be inside the house. Allowing for a partially open window loss of 15dB, as per BS8233, internal noise levels resulting from the noise of HGVs manoeuvring (34dB(A) externally) would be expected to be 19dB(A), and 9dB(A) internally from loading. These are much lower than the corresponding BS8233 guideline level detailed in Table 3.2 (although it is noted that this guidance is intended for consideration of anonymous noise), and is also slightly lower than the existing average noise levels measured during the quieter night time periods without any activity, (i.e., the residual noise climate).

This would suggest that the level of impact derived using the noise hierarchy would lie between *lowest observed adverse effect level* and *observed adverse effect*.

Although the WHO Guidelines are intended for the assessment of what is often referred to 'anonymous' noise, such as distant traffic, the levels on site from activity at 34dB(A) are considerably

below the 50dB level suggested at which the onset of annoyance may begin, which would suggest that there would be limited impact on amenity during the daytime.

## 7. Conclusion

A baseline noise survey has been undertaken by Venta Acoustics to establish the background noise climate in the locality of Broadway Farm, Broad Oak, Botley.

The noise levels associated with the change of use of the southern parking area and installation of two new docking stations to the warehouse have been assessed against BS4142:2014 *Methods for rating and assessing industrial and commercial sound*.

The assessment shows a low impact on the nearby offsite residential receivers, with a marginal impact on the on-site receptor at Broadway Farm. However, this assessment is based upon external noise. The residents of Broadway Farm are not likely to experience the noise externally during the quietest part of the night, and so a discussion of internal noise levels has been included.

When considered against the guidance provide in the NPPF, NPSE, PPG and WHO, noise levels would be audible at the nearby residences, although at a level which would be considered of low impact, and the level of change from the current situation is expected to be between the LOAEL and OAEL.

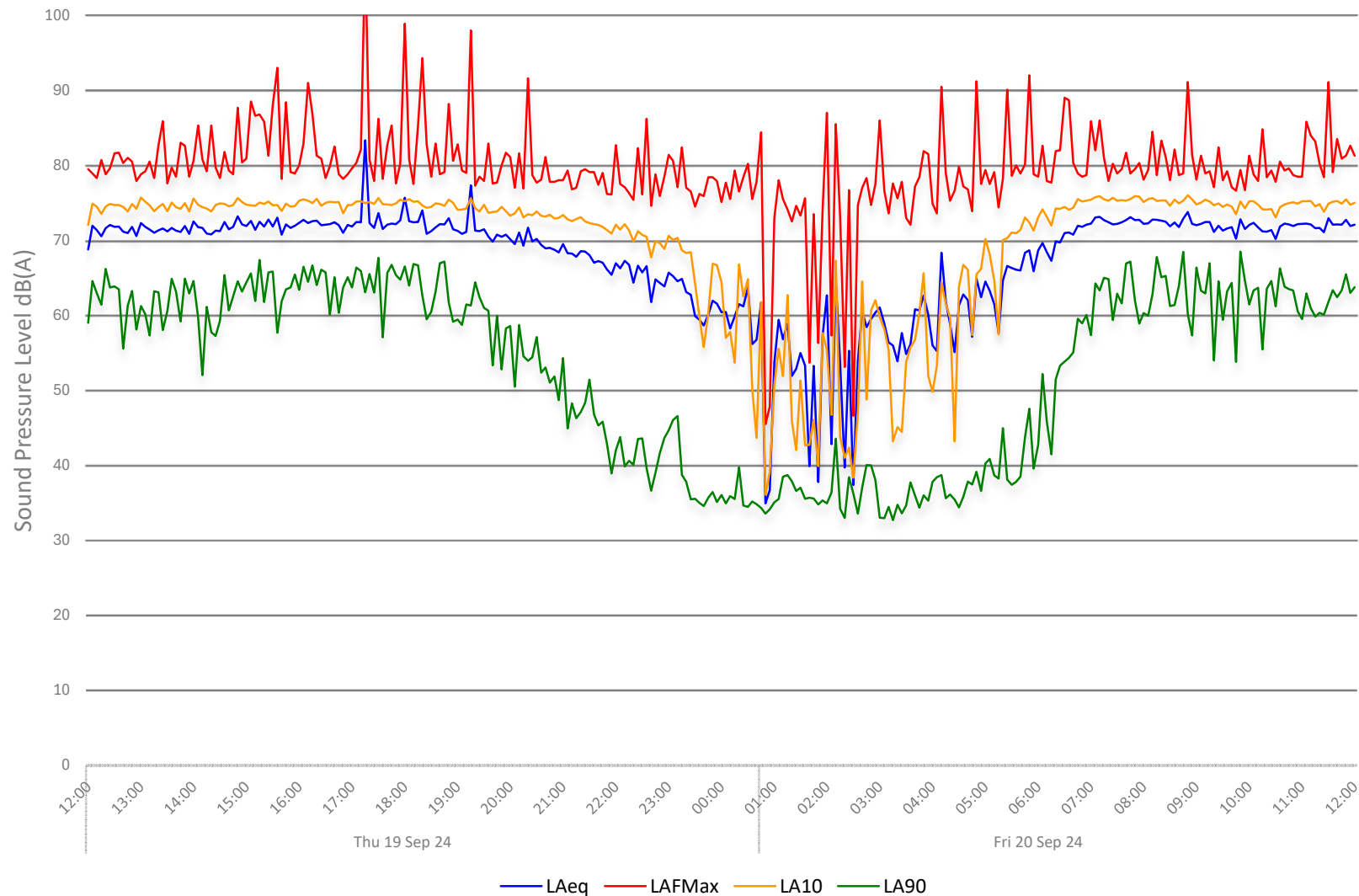
**Jamie Duncan MIOA**



Broadway Farm, Broad Oak, Botley  
Environmental Noise Time History: 7  
Position 3 - Front Gate



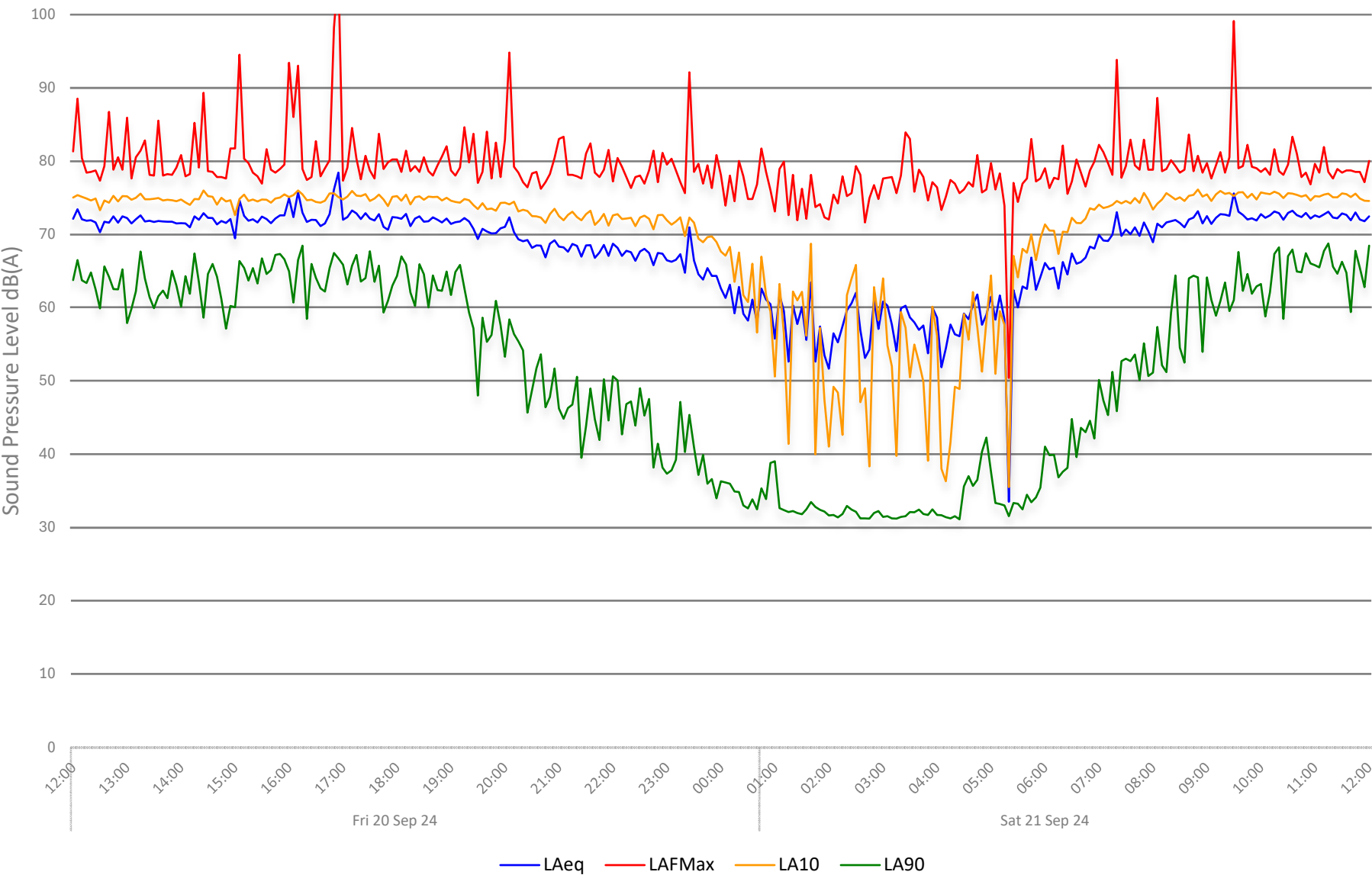
Figure VA5551/TH7



Broadway Farm, Broad Oak, Botley  
Environmental Noise Time History: 8  
Position 3 - Front Gate



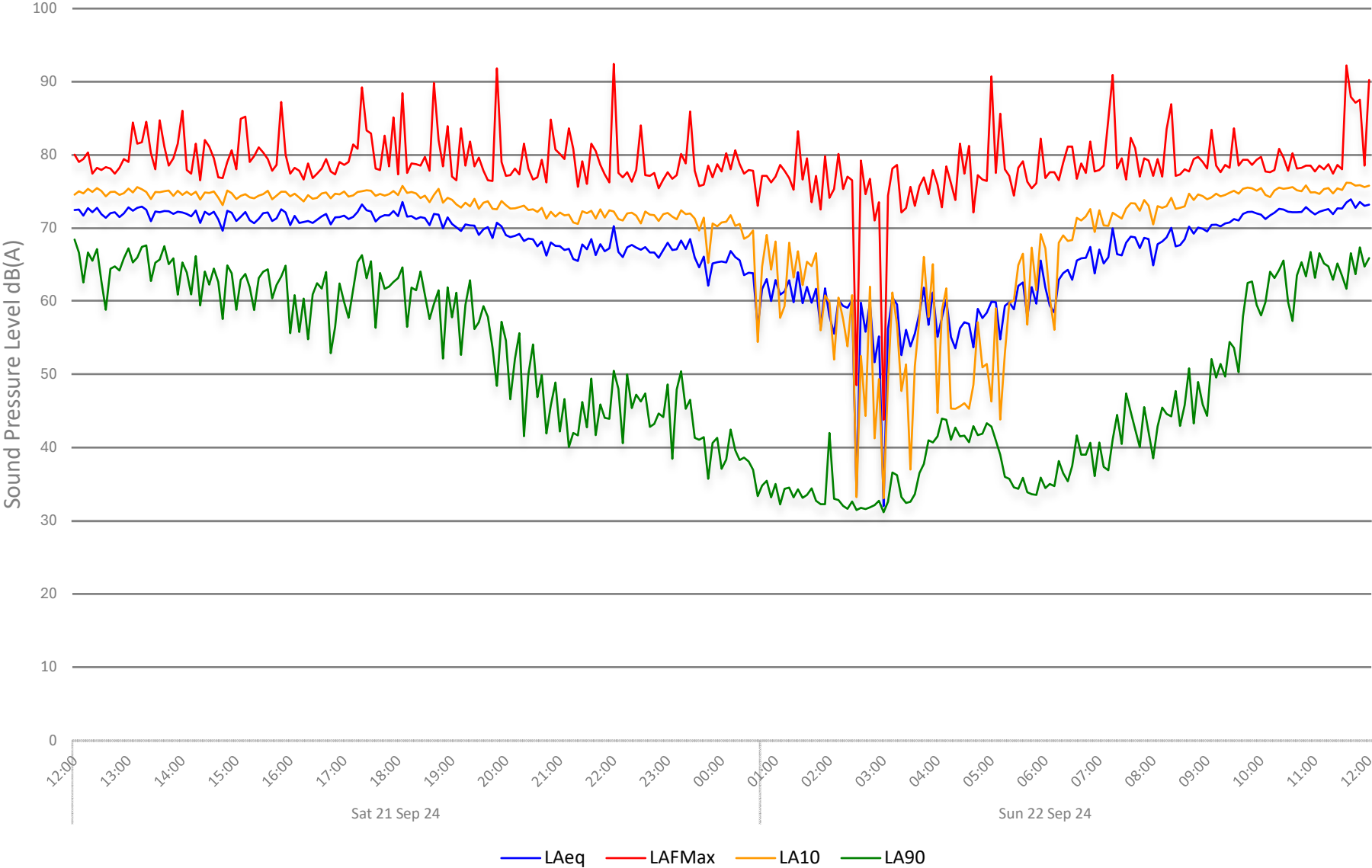
Figure VA5551/TH8



Broadway Farm, Broad Oak, Botley  
Environmental Noise Time History: 9  
Position 3 - Front Gate



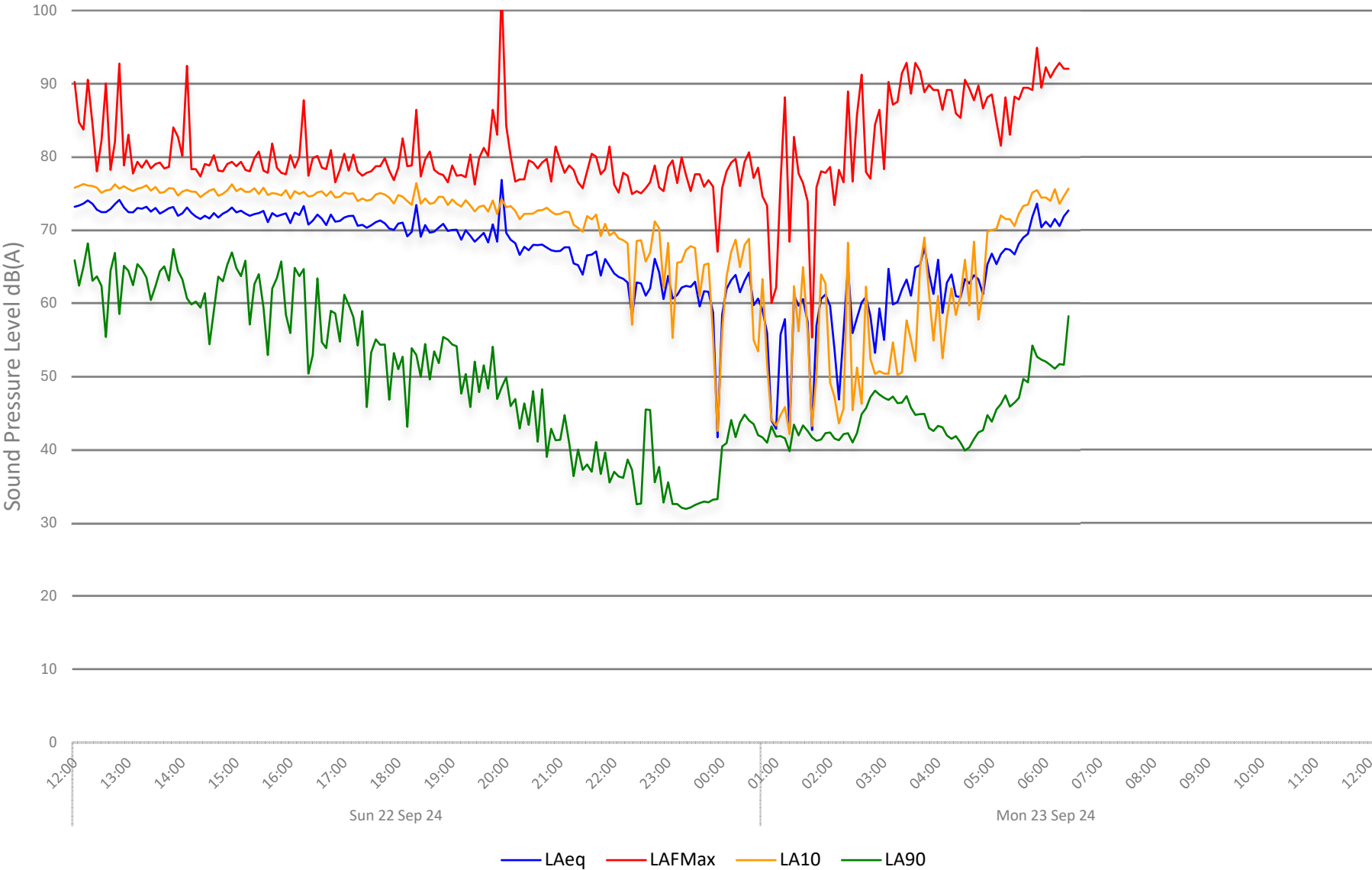
Figure VA5551/TH9



Broadway Farm, Broad Oak, Botley  
Environmental Noise Time History: 10  
Position 3 - Front Gate



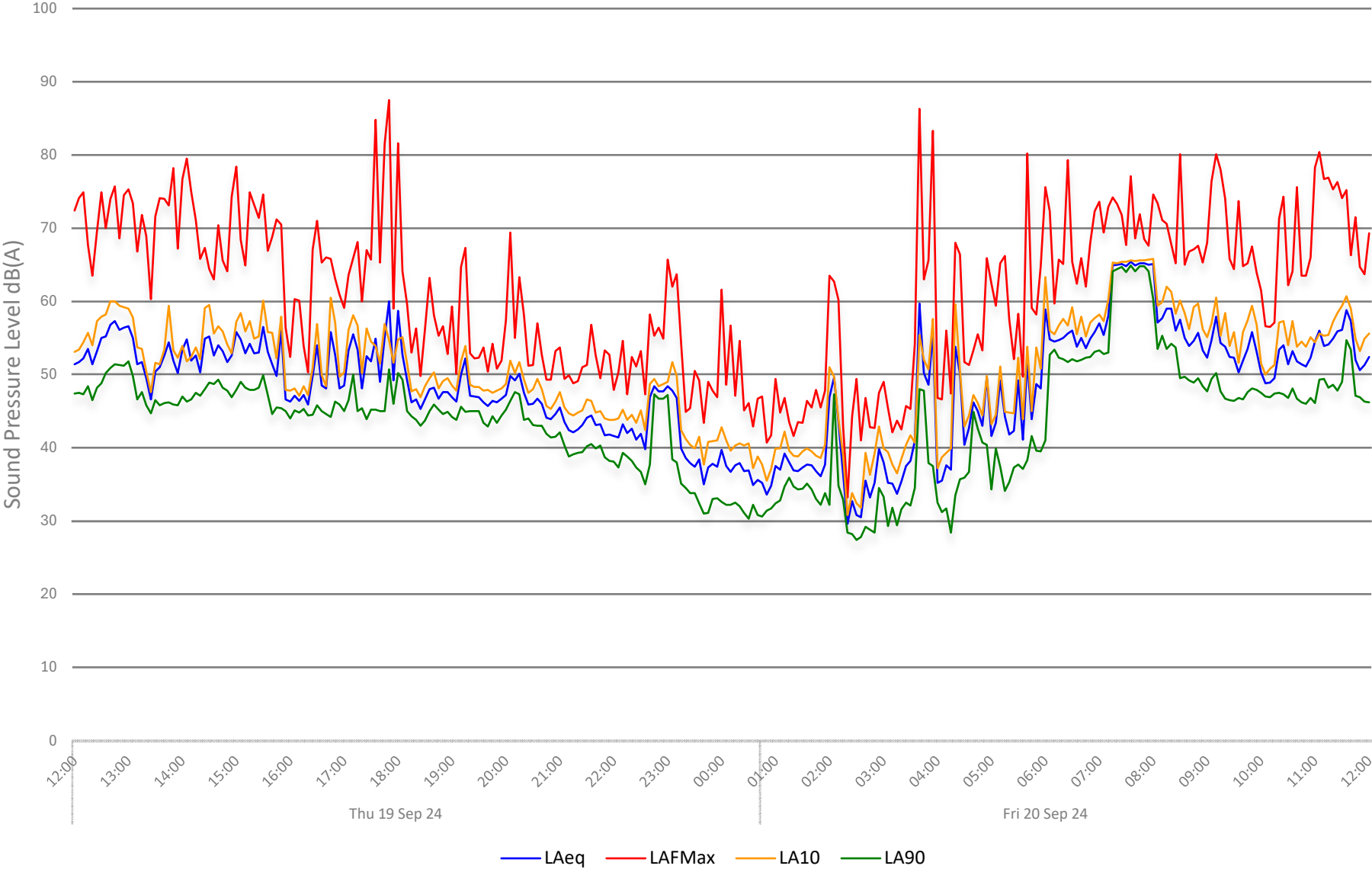
Figure VA5551/TH10



Broadway Farm, Broad Oak, Botley  
Environmental Noise Time History: 1  
Position 1 - West



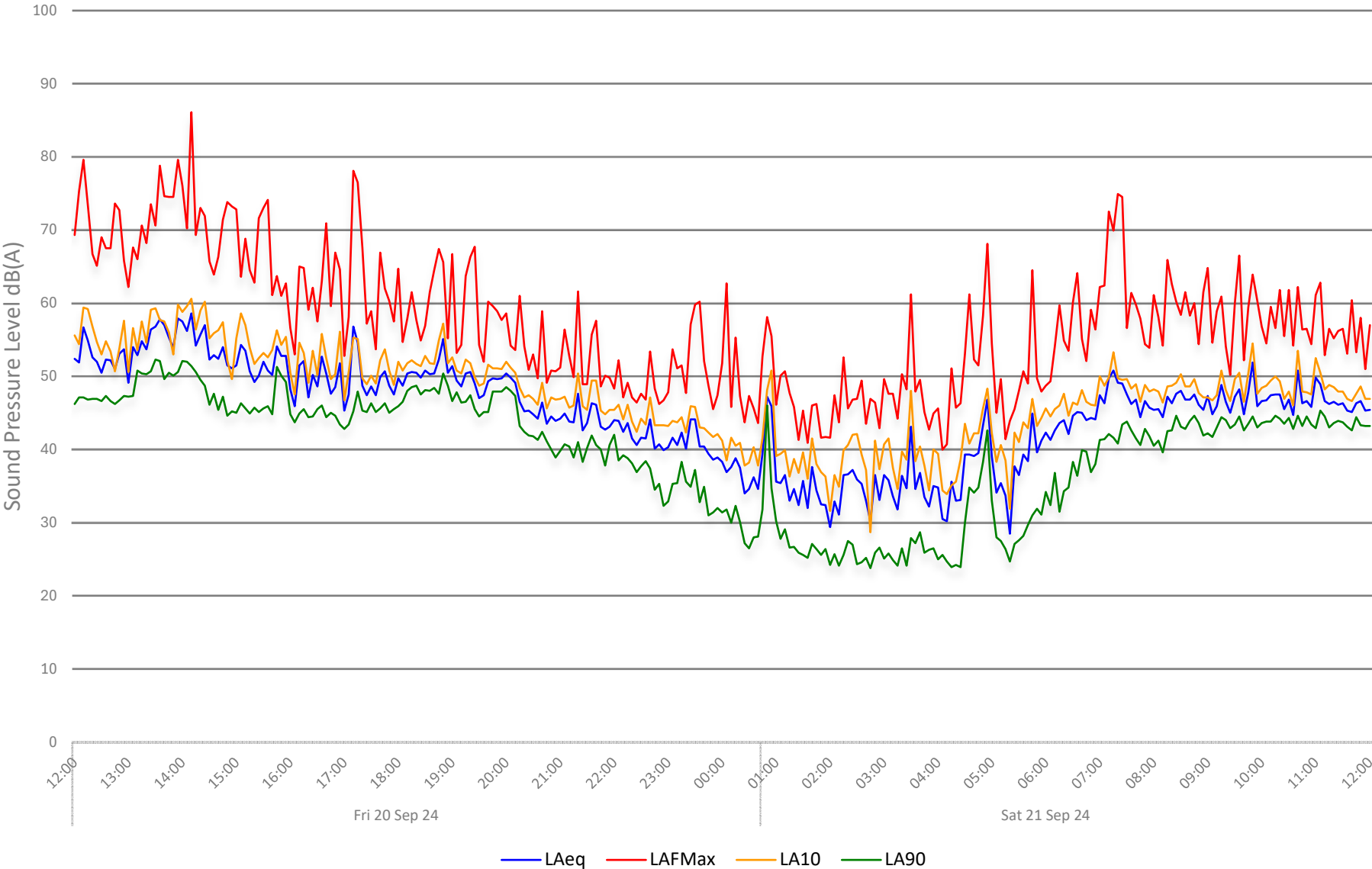
Figure VA5551/TH1



Broadway Farm, Broad Oak, Botley  
Environmental Noise Time History: 2  
Position 1 - West



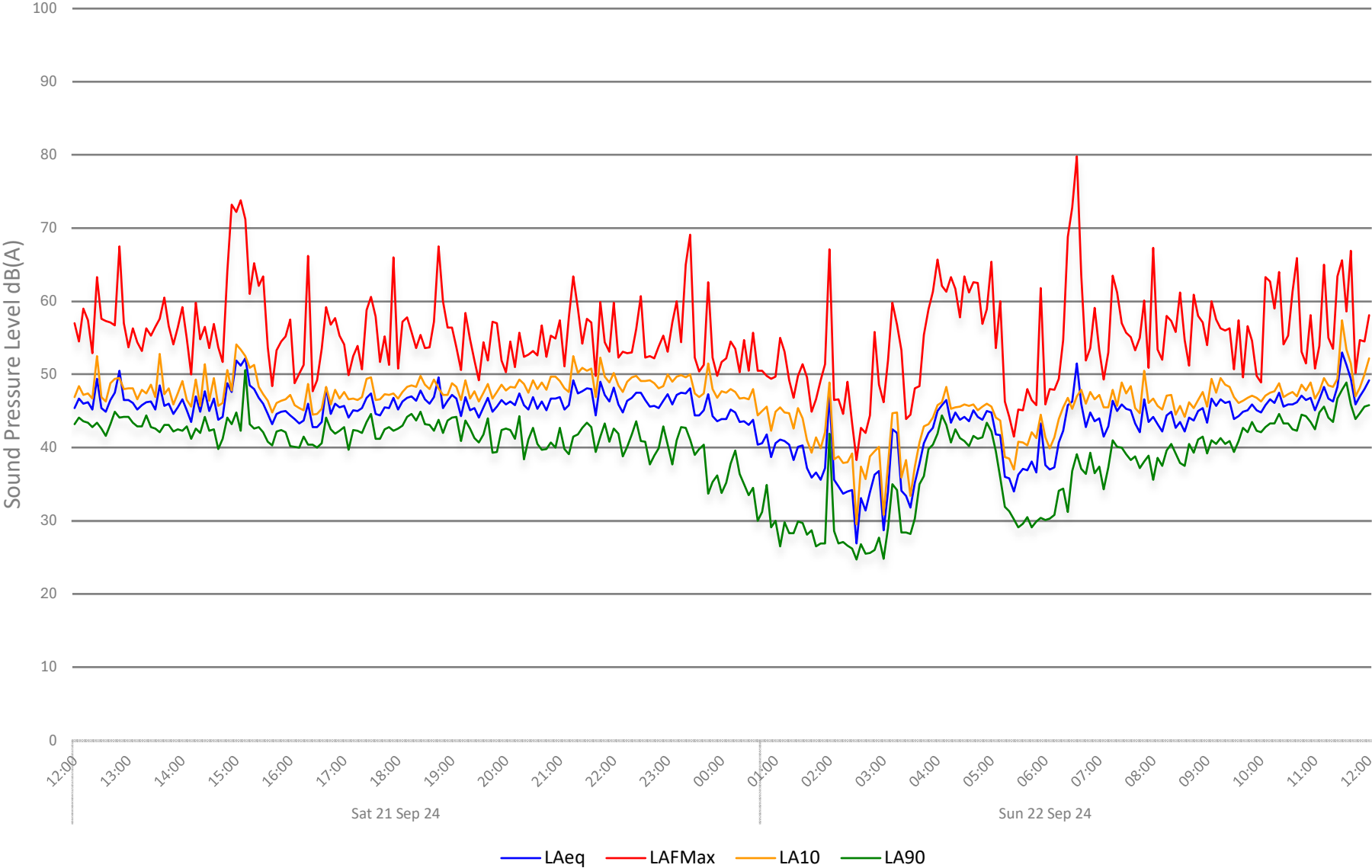
Figure VA5551/TH2



Broadway Farm, Broad Oak, Botley  
Environmental Noise Time History: 3  
Position 1 - West



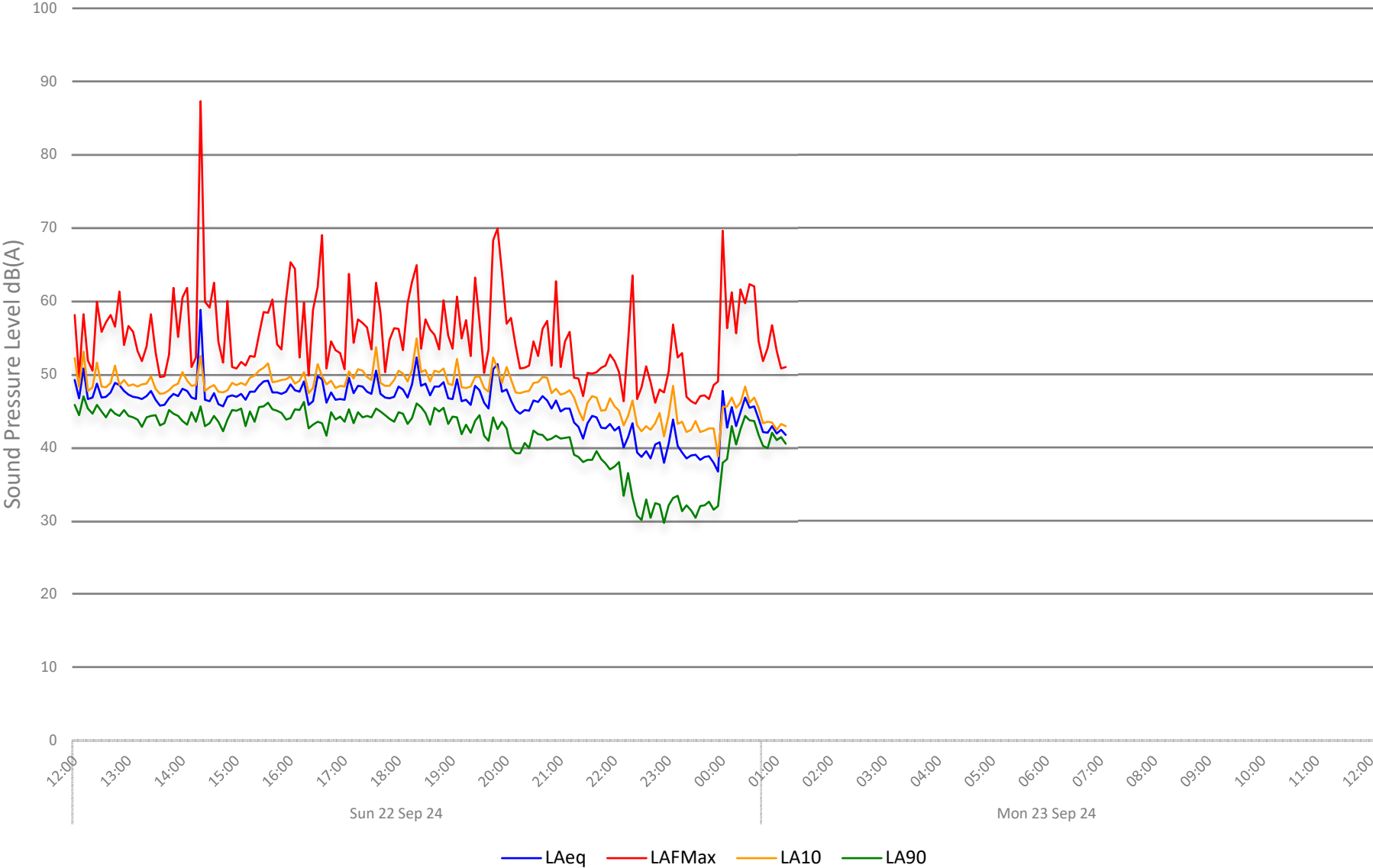
Figure VA5551/TH3



Broadway Farm, Broad Oak, Botley  
Environmental Noise Time History: 4  
Position 1 - West



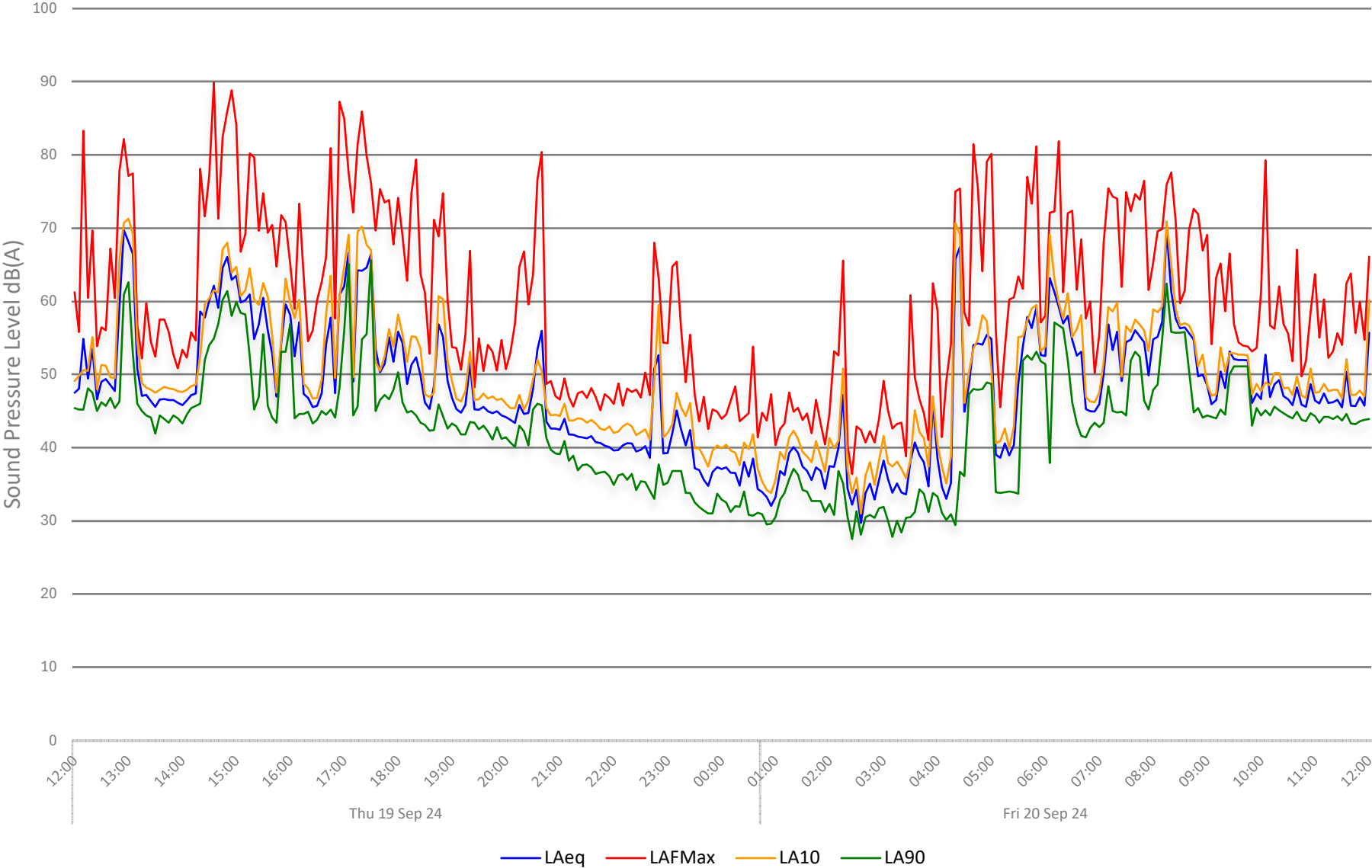
Figure VA5551/TH4



Broadway Farm, Broad Oak, Botley  
Environmental Noise Time History: 5  
Position 2 - West



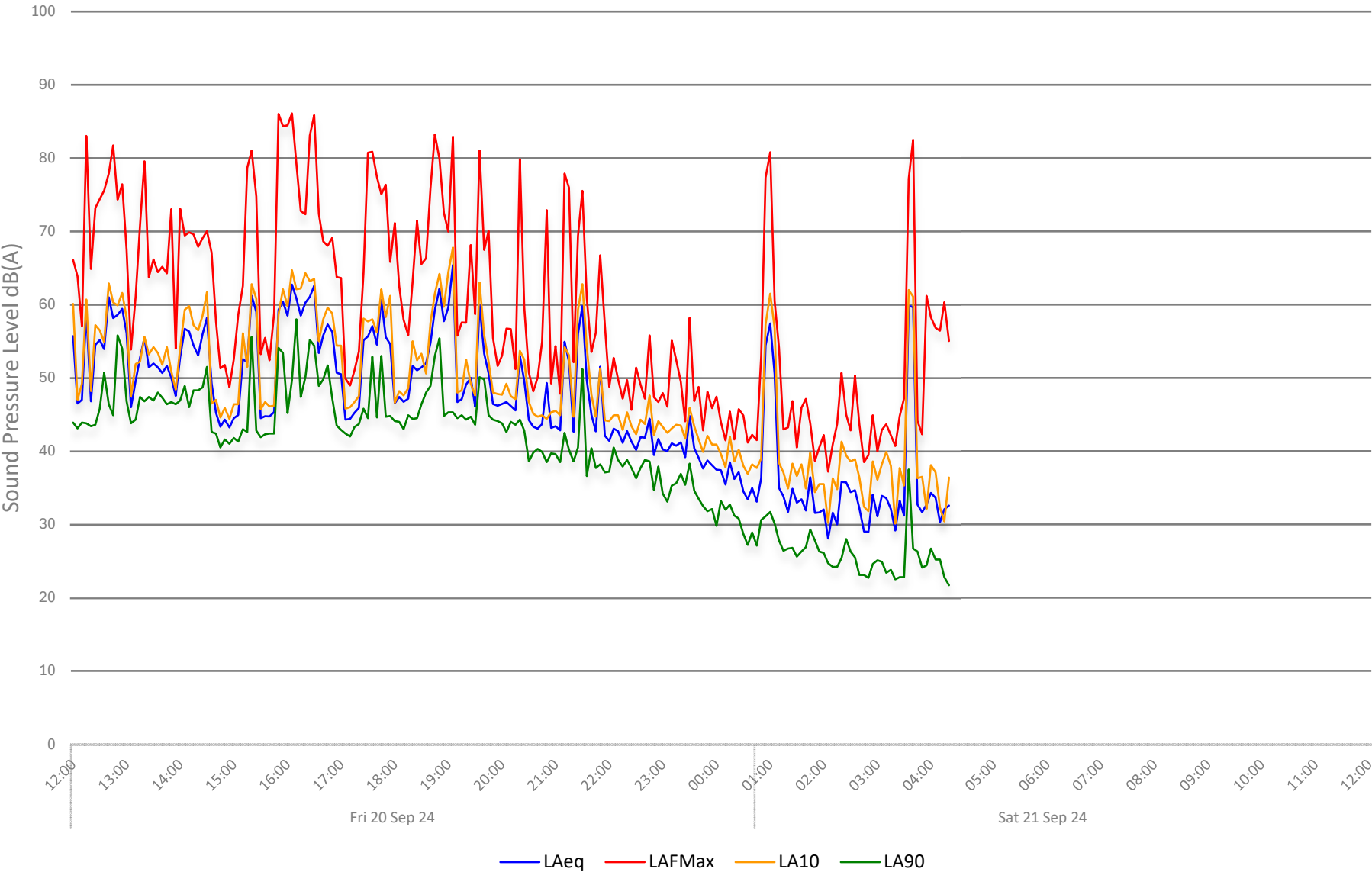
Figure VA5551/TH5

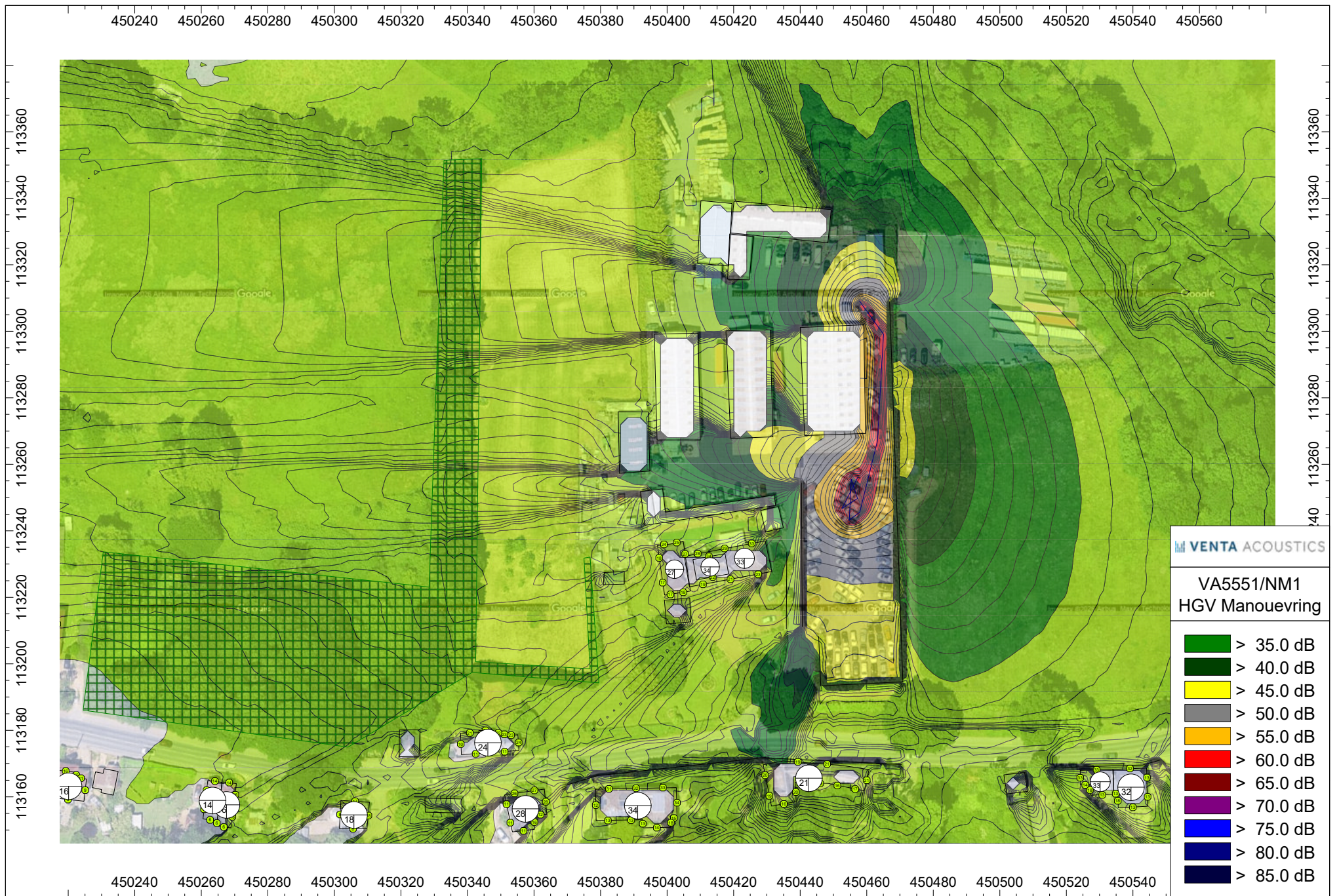


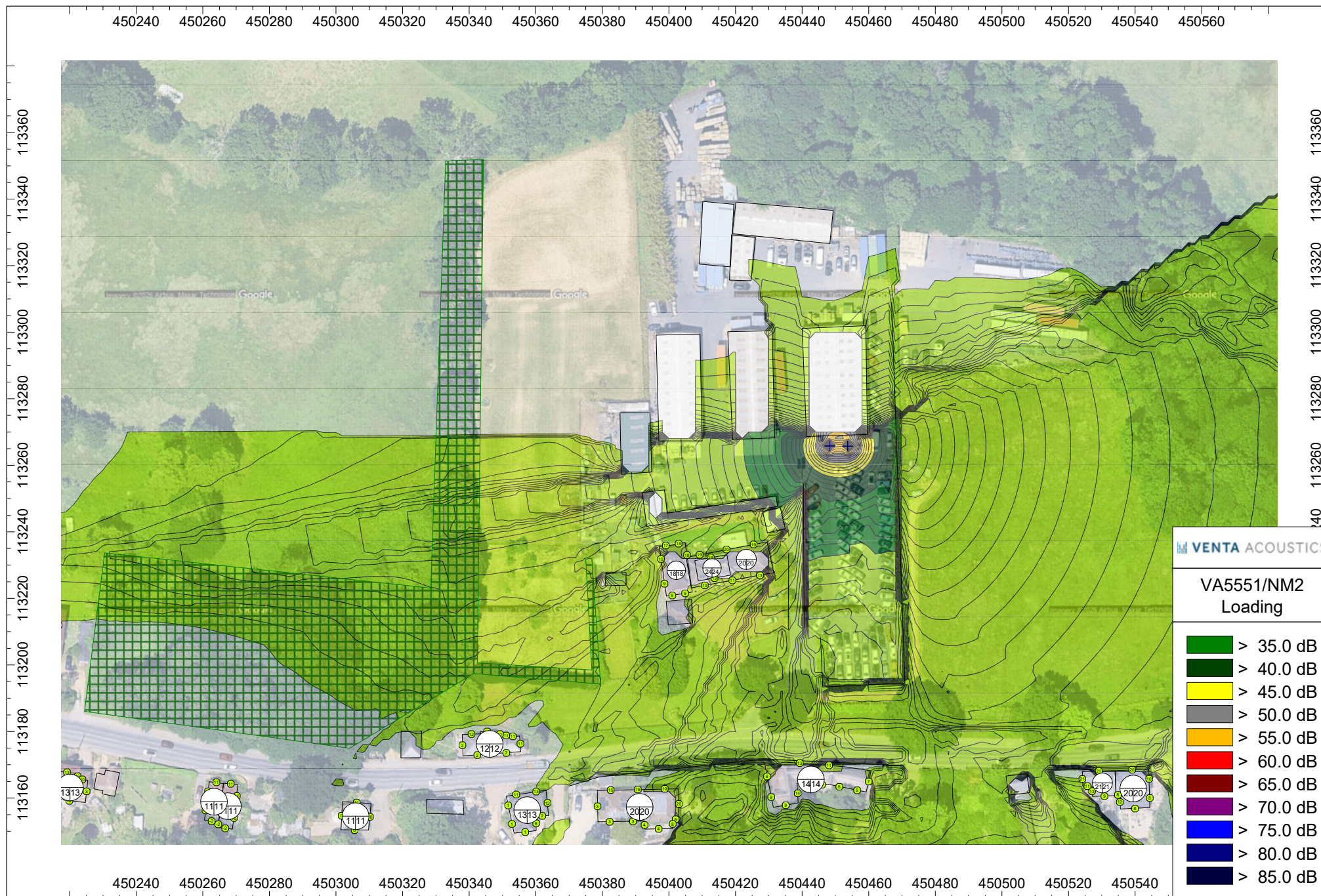
Broadway Farm, Broad Oak, Botley  
Environmental Noise Time History: 6  
Position 2 - West



Figure VA5551/TH6







# 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.                                                                                                                                                                                                                                                                                                                                                                |

### 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 |
|---------------------------------|--|----|--|-----|--|-----|--|-----|--|------|--|------|--|------|--|------|

# APPENDIX A

## Acoustic Terminology & Human Response to Broadband Sound

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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.

| Change in Sound Level<br>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 |