

**MARRIOTT MEON VALLEY**

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& Country Club**

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**Assessment of Music  
Sound Levels**

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Report No. 01023\R01

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## **1 INTRODUCTION**

The Marriott Meon Valley Hotel & Country Club has installed a temporary marquee structure in the hotel grounds for special events, including dinners and dances. The marquee has planning consent until 2008 and the Hotel is applying for consent for holding licensable activities, such as the provision of regulated entertainment and the sale of alcohol in the marquee under the Licensing Act 2003.

The licensing authority has requested that an assessment of noise levels from regulated entertainment be submitted with the application and The English Cogger Partnership has been commissioned to undertake the study, based on a representative event held in the marquee.

## **2 SITE CONTEXT**

The Marriott Meon Valley Hotel & Country Club is located on land to the east and south of Sandy Lane, and north of the A334 at Shedfield, Hampshire. The Hotel building is situated approximately 250 m east of Sandy Lane and the marquee is to the south east and adjacent to the hotel complex. The remaining land is primarily developed as a golf course, although there are tennis courts and a driving range to the west and car parking to the northwest and adjacent to the hotel. A site plan is shown at Figure 1.

The surrounding area is rural, with isolated houses, or groups of houses near the site boundary. The village of Shedfield located to the south of the site is on the A334 main road that links the A32 trunk road and the village of Wickham, to the east, with the outlying suburbs of Southampton, to the west.

The marquee has been used for functions since the granting of planning consent and it is understood that complaints relating to noise from these events have been received from the occupants of nearby residential properties, particularly Shedfield House and Grange Farm, but also from Shedfield Cottage. These properties are shown in Figure 1. Occupants of other nearby properties, including Woodman's Paddock, Lanes Cottage and House Gates are understood not to hear the functions.

## **3 GUIDANCE ON LIMITING NOISE FROM ENTERTAINMENT VENUES**

### **3.1 The Licensing Act 2003**

The Licensing Act 2003 provides for a unified system of regulation of the activities of the sale and supply of alcohol, the provision of regulated entertainment and the provision of late night refreshment. In the Act, these activities are referred to collectively as "the licensable activities". The purpose of the system of licensing for licensable activities is to promote four fundamental objectives ("the licensing objectives"). Those objectives are:

- a) the prevention of crime and disorder;
- b) public safety;
- c) the prevention of public nuisance; and
- d) the protection of children from harm.

Of these, the prevention of public nuisance includes noise, and implementation of the Licensing Act would seek to prevent circumstances arising that would result in the licensable activities giving rise to a statutory nuisance resulting from noise.

### **3.2 The Environmental Protection Act 1990**

The legislation that governs statutory nuisance is the Environmental Protection Act, 1990 (EPA), which enables a Noise Abatement Notice to be issued if it is considered that a “nuisance” is being caused. The EPA does not, however, provide an objective basis on which to judge whether a noise is a nuisance, because of the subjective nature of the human response to noise, although it is generally recognised that a balance must be found between the possibly conflicting rights of the occupier to do as he wishes on his land and the right of a neighbour not to suffer interference. In reaching that balance, account needs to be taken of such aspects as undue sensitivity to noise, the degree of interference and the character of the locality.

A Noise Abatement Notice served under the EPA would, if upheld, override any conditional planning consent or conditions imposed through the Licensing Act and any breach of an Abatement Notice would be a criminal offence, liable to a fine of up to £20 000 for each breach.

### **3.3 Other Guidance**

#### **3.3.1 Chartered Institute Of Environmental Health**

The Chartered Institute of Environmental Health published a Noise Management Guide in 1997<sup>1</sup>, directed at local authority Environmental Health departments, which has a particular emphasis on developing an effective response to domestic noise complaints. The concept of nuisance is discussed at Chapter 4, section 4.3, and guidance is provided to assist in determining whether a particular source of noise would be judged to be a statutory nuisance, rather than simply an annoyance. The following statements are of particular relevance:

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<sup>1</sup> Chartered Institute of Environmental Health, *Noise Management Guide - Guidance on the Creation and Maintenance of Effective Noise Management Policies and Practice for Local Authorities and their Officers*, London, Chadwick House Group, 1997

*For any noise to constitute a statutory nuisance, it must either be likely to cause injury to health or amount to a nuisance at common law.*

where

*“... likely to cause ...” means probably likely, not just possibly likely.*

*The interference complained of must be unreasonable and substantial; the law implies a degree of “give and take” between neighbours - between the right of one occupier to use his land as he likes and the right of his neighbour to live in peace, nor is it concerned in any event with trifles - the “de minimus” rule. Mere annoyance is probably not enough nor do questions of individual taste come into it.*

*What is unreasonable will be a matter of fact, depending on the circumstances. A particular noise at midday may be reasonable yet if repeated at midnight, not be. Some things are inherently noisy but still must be done; where in such circumstances noise is inevitable, it will not be unreasonable.*

*The consent of a person affected is not to be implied by his “coming to the nuisance” but in the case of an “amenity” nuisance such as noise, the character of the neighbourhood will be relevant to what is reasonable; “what would be a nuisance in Berkeley Square would not necessarily be so in Bermondsey”.*

### **3.3.2 Code of Practice on Environmental Noise Control at Concerts**

The Noise Council<sup>2</sup> published guidance on noise control at music events, primarily aimed at large events held in sports stadia, arenas, open air sites and, of relevance to the Marriott Meon Valley, within lightweight buildings. The purpose of the code was to give guidance on how disturbance and annoyance from such events could be minimised and to assist those planning and licensing events and those responsible for enforcing the nuisance provisions of the Environmental Protection Act (see above). It is noted that compliance with the Code of Practice does not, of itself, confer immunity from legal obligations. Although The Noise Council is no longer extant, the Code of Practice has not been superseded by other guidance.

The Code recommends criteria limiting the Music Noise Level (MNL, defined as the  $L_{Aeq}$  of the music noise at any location) at 1 m from the façade of noise sensitive premises. The MNL limits recommended in the guidance are a function of the number of events held in a year, the type and location of the venue and the time of day and those relating to “rural venues” are shown in the table below:

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<sup>2</sup> The Noise Council, *Code of Practice on Environmental Noise Control at Concerts*, London, The Noise Council, 1995

Concert days per calendar year	Time during which event is held	Guideline limit
1 - 3	09:00 – 23:00 hours	The MNL should not exceed 65 dB(A) over a 15 minute period
4 - 12	09:00 – 23:00 hours	The MNL should not exceed the background noise level by more than 15 dB(A) over a 15 minute period
Up to 30 (for indoor venues)	09:00 – 23:00 hours	The MNL should not exceed the background noise level by more than 5 dB(A) over a 15 minute period
Any number of events	23:00 – 09:00 hours	Music should not be audible within noise sensitive premises with windows opened for ventilation

The background noise level is defined as the arithmetic average of the hourly  $L_{A90}$  measured over the last four hours of the proposed music event, or over the entire music event if scheduled to last for less than four hours.

### 3.3.3 IOA Good Practice Guide on the Control of Noise from Pubs and Clubs

The Institute of Acoustics has recently published guidelines on the control of noise from public houses, clubs, hotels, discotheques, restaurants, community halls and similar premises<sup>3</sup>. In addition to venues that are permanent structures, the guidance also refers to music singing and speech originating from outside buildings, including receptions and parties held in marquees (paragraph 3.5).

At paragraph 2.4 of the Guide it is stated that

*Music, singing and speech, both amplified and non-amplified, are common sources of noise disturbance ... and that*

- *for premises where entertainment takes place on a regular basis, music and associated sources should not be audible inside noise-sensitive property at any time ...*
- *for premises where entertainment takes place less frequently, music and associated sources should not be audible inside noise-sensitive property between 23:00 and 07:00 hours. For other times, appropriate criteria need to be developed which balance the rights of those seeking and providing entertainment, with those who may be disturbed by the noise.*

<sup>3</sup> Institute of Acoustics, *Good Practice Guide on the Control of Noise from Pubs and Clubs*, St Albans, IOA, 2003

It is recommended that the definition of “regular” (and hence, by implication “less frequently”) should be *determined on a local basis to reflect local expectations*.

While it is stated in the guide that the determination of nuisance is not within the scope of the guide, it may be useful in forming a view on the likelihood that a nuisance has occurred, is occurring or could occur. It is also stated at paragraph 2.6 that the Guide should not be used for occasional music events of the type covered by the *Code of Practice on Environmental Noise Control at Concerts*.

### 3.3.4 Correlation of guidance

In attempting to establish suitable criteria to determine whether noise from events held in the marquee at the Marriott Meon Valley can meet the licensing objectives of the Licensing Act 2003, it is appropriate to determine which of the guidance discussed above is most apposite to the venue.

The Noise Council code of practice applies to “*large music events involving high powered amplification ...held in stadia, arenas, open air sites and within lightweight buildings*” (paragraph 1.1) and is “*not designed to address the question of environmental noise arising from discotheques, clubs and public houses ...*” (paragraph 1.4). Whilst this exclusion could be interpreted to relate to noise from permanent buildings, rather than the open air sites and lightweight buildings referred to in paragraph 1.1, there is no definition of what would constitute a “large” event, except that paragraph 1.1 also refers to such events giving pleasure to “hundreds and in some cases thousands of people”.

The guidance is, however, particularly helpful in that it provides quantitative criteria that can be monitored without the need for access to noise sensitive premises. Whilst the MNL is specified at 1 m from the façade of noise sensitive premises, this can be used to derive a free field level at, for example, the property boundary or some other accessible monitoring location by subtracting 3 dB from the façade level to convert it to a free field level and correcting for any difference in distance attenuation.

The IOA guide does refer specifically to events held in marquees, but is stated to exclude “*occasional events*” that would be covered by the Noise Council code of practice.

Notwithstanding the uncertainty in scope of the two documents when applied to events in lightweight structures such as the marquee at the Marriott Meon Valley, there is a consensus that events should be inaudible after 23:00 *within* residential properties. In both documents, the test for inaudibility of external noise sources is based on windows opened for ventilation.

For events prior to 23:00, the IOA guide provides no objective criteria, whereas the Noise Council code of practice specifies limits for up to 30 events held in (lightweight) indoor venues. It is, therefore, concluded that the Noise Council code can be taken as an appropriate source for developing suitable criteria “*which balance the rights of those seeking and providing entertainment, with those who may be disturbed by the noise*”, as recommended in the IOA guide.



### 3.4 Criteria for Events at the Marriott Meon Valley

On the basis of the guidance above, and in seeking to balance the rights of the operators of the hotel and their neighbours, it is concluded that it would be appropriate to set limits on the use of the marquee that meet the following criteria:

- between 09:00 hours and 23:00 hours the music noise level, as defined in the Noise Council Code of Practice and measured at 1 m from the façade of any residential property should not exceed the background noise level by more than 5 dB(A) over a 15 minute period;
- the number of licensable activities where the music noise level exceeds the background noise level, when measured at 1 m from the façade of any residential property should not exceed 30 in any calendar year;
- between 23:00 hours and 09:00 hours, music should not be audible within noise sensitive premises with windows opened for ventilation.

Whilst the inaudibility of music within neighbouring premises is difficult for the hotel operator to check, without the agreement of the occupant, a suitable limit on music levels within the marquee could be established by testing, with their cooperation. In the absence of such an agreement, it may be appropriate to set a limit in the marquee that can be shown by calculation to be likely to limit the free field music level at the noise sensitive property boundary to, for example, at least 5 dB below the background noise level likely to obtain between 23:00 hours and the end of the event.

## 4 MUSIC NOISE ASSESSMENT

An assessment of the noise from a representative event held in the marquee was undertaken on 26 January 2007. The event was a dinner dance with a band playing amplified music from approximately 22:00 hours to midnight. There was an interval during this period, when the PA system was used for speech.

### 4.1 Measurement Methodology

Noise levels were measured during the playing of amplified music at four locations:

- in the marquee;
- at the boundary of the hotel grounds on Sandy Lane, opposite Grange Farm (denoted measurement location 1 on Figure 1);
- at the boundary of the hotel grounds adjacent to Shedfield House (denoted measurement location 2 on Figure 1);
- at a point approximately 30 m west of the marquee, on the footpath;.

The measurement locations are shown in Figure 1.

At the time of the measurements the weather was dry with a very light north-westerly wind. The wind conditions marginally favoured propagation from the marquee towards Shedfield house and also would marginally reduce propagation from the A334 towards the residential properties.

#### 4.1.1 Instrumentation

Noise levels were measured using a Rion sound level meter, type NL-32 (serial number 002406670), fitted with a Rion type NX-22RT 1/1-1/3 Octave RTA Card (serial number 00830372, version 2.1), a Rion type UC-53A ½-inch free field microphone (serial number 305924) and a Rion type NH-21 pre-amplifier (serial number 10711). The microphone was fitted with a windshield during the measurements. The sound level meter, microphone and preamplifier were last calibrated in a calibration laboratory on 16-20 November 2006 and calibration and conformance certificates are available.

Prior to and on completion of the survey, the sound level meter and microphone calibration was checked using a Rion type NC-74 Sound Level Meter Calibrator (serial number 00830811). The Calibrator was last calibrated on 15 November 2006, in accordance with the requirements of ISO 10012 and a calibration and conformance certificate is available. No change in the calibration level occurred during the survey.

#### 4.1.2 Data analysis

The measured data are shown in Figure 2 as the ⅓-octave frequency spectra. All levels, including the ambient noise data (measured at Grange Farm during an interval in the music, when no significant contribution from the marquee was evident and at Shedfield House after the event had finished) are expressed as the  $L_{Aeq}$  (the energy average in each band). The overall levels measured are summarised below, with the music level corrected for the contribution from the ambient noise to give the actual contribution from the music. The background noise level (expressed as the noise level exceeded for 90% of the measurement time period) was also measured at Grange Farm (during the interval) and at Shedfield House after the event. This value can be used as the basis for the noise level criteria developed at section 3.4.

It can be seen from the tabulated data that the contribution at the boundary locations exceeded the measured background noise level by 6 dB at both locations, marginally exceeding the criterion for music events held before 23:00 hours and exceeding the criterion for music played after 23:00 by 11 dB.

Location	Total noise level, dB $L_{Aeq}$	Music level, dB $L_{Aeq}$	Background level, dB $L_{A90}$
Marquee (internal reverberant level)	88	88	-
30 m from marquee	60	60	-
Boundary at Grange Farm (240 m)	45	44	38
Boundary at Shedfield House (290 m)	42	41	35

The level measured at 30 m can be used to determine the equivalent sound power level of the source (assuming hemispherical propagation from a point source). The measurement at 30 m can then be used as a reference, if required, to check that noise criteria are not being exceeded and also to calculate the noise level at any residential properties due to the music alone. The calculated sound power level provides an estimated level of 42 dB  $L_{Aeq}$  at the boundary with Grange Farm and 40 dB  $L_{Aeq}$  at the boundary with Shedfield House. These levels are 1-2 dB lower than the measured values, probably as a result of some screening of the marquee by the massing of the hotel building, and if the location is used as a location for checking noise emissions from the marquee, it is recommended that a 2 dB correction be applied to allow for the screening.

## 5 CONCLUSIONS AND RECOMMENDATIONS

A review of the guidance relating to the control of music has been undertaken and it has been concluded that a balance between the rights of the hotel operators and those of neighbours would be achieved if the following conditions are applied to use of the marquee for licensable activities involving amplified live or recorded music:

- between 09:00 hours and 23:00 hours the music noise level, as defined in the Noise Council Code of Practice and measured at 1 m from the façade of any residential property should not exceed the background noise level by more than 5 dB(A) over a 15 minute period;
- the number of licensable activities where the music noise level exceeds the background noise level, when measured at 1 m from the façade of any residential property should not exceed 30 in any calendar year;
- between 23:00 hours and 09:00 hours the music noise level should be such as to achieve a level at least 5 dB below the background noise level at the boundary of the hotel adjacent to the nearest noise sensitive properties.

Measurements of noise levels from amplified music have shown that these conditions can be achieved if the following criteria are complied with:

- during the period 09:00 to 23:00 hours, the reverberant noise level from amplified music measured within the marquee should not exceed 85 dB  $L_{Aeq}$  when measured over a period of 15 minutes;
- during the period 23:00 to 09:00 hours, the reverberant noise level from amplified music measured within the marquee should not exceed 75 dB  $L_{Aeq}$  when measured over a period of 15 minutes.

These criteria are marginally lower than the possible limits indicated by the measurements, to allow for uncertainty in any measured data. The recommended music level before 23:00 hours is only 3 dB lower than that obtaining during the event on 26 January 2007 and the change required to meet this criterion is unlikely to be perceptible to an audience.

It should be noted that the samples measured indicated relatively high levels of bass in the music, particularly in the 50, 63 and 100 Hz  $\frac{1}{3}$ -octave bands (the 63 Hz octave band). Control of the low frequencies using an octave or  $\frac{1}{3}$ -octave equaliser will be necessary and it is recommended that levels measured in the marquee be reduced to not more than the values shown in the table below, at an overall level of 85 dB(A):

	Centre frequency, Hz								
	50	63	80	100	125	160	200	250	315
$\frac{1}{3}$ -octave band limits	70	73	75	80	80	80	80	80	80
Octave band limits	78		85			85			

If a check on the levels at a remote reference point is preferred, the limit at the measurement location 30 m from the marquee should not exceed 57 dB  $L_{Aeq}$  during the period 09:00 to 23:00 hours and 47 dB  $L_{Aeq}$  during the period 23:00 to 09:00 hours.

The internal noise level criteria are based on the existing sound insulation of the marquee. If modifications to the marquee, such as the introduction of a barrier mat and acoustic absorption in the roof void and additional panelling to provide a “cavity wall” construction, can be shown to provide additional sound insulation, higher internal noise levels after 23:00 hours may be permissible whilst maintaining satisfactory noise conditions at the noise sensitive receiver locations. Suitable levels would be assessed by undertaking commissioning checks at the noise sensitive properties, or at the property boundary.

The music noise levels can be checked and controlled using a suitable noise limiter and an octave or  $\frac{1}{3}$ -octave equaliser in the marquee and, if necessary, using a sound level meter at the 30 m reference location, or another agreed reference point at a similar distance. The reference location, if used, should be selected to be easily identifiable, with a direct line of sight to the marquee. A location approximately 25-30 m from the marquee would provide free field sound levels with a sufficient margin above the ambient noise without music to allow certainty in the measurement of the music noise level under most commonly occurring weather conditions.

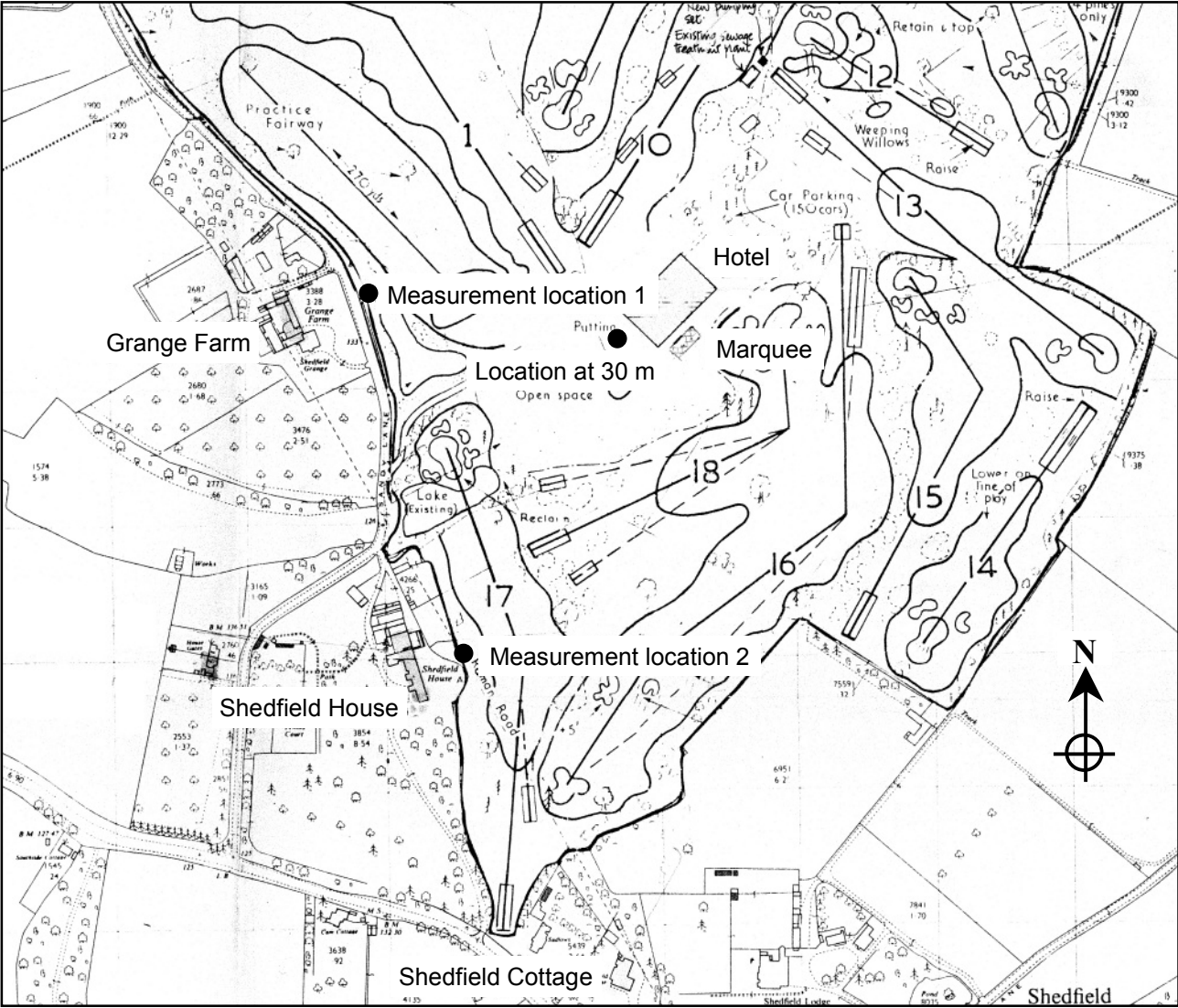


FIGURE 1: Site plan showing noise sensitive premises and monitoring locations

## **APPENDIX 1**

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### **Acoustic Terminology**

## ACOUSTIC TERMINOLOGY

### Environmental Noise

Environmental noise is normally described in terms of the single figure A-weighted sound pressure level, in decibels (dB). The A-weighting corresponds to the frequency sensitivity of the ear and, therefore, provides an approximation to the subjective response to sound at different frequencies. When a sound level is expressed in this way, the units can be denoted dB(A).

When sound is time varying, it is convenient to express the sound level using an indicator, or descriptor that takes account of this variation. Two types of indicator are in common use, the equivalent continuous sound level and the statistical indicators.

### Equivalent Continuous Sound Level

This indicator provides the overall noise exposure to time varying sound and is the energy average of the sound over a specified time period. It is the notional steady level that would, over a given period of time, deliver the same sound energy as the actual fluctuating sound over the same period. It is denoted  $L_{eq, T}$ , or, if A-weighted,  $L_{Aeq, T}$ , where T is the time period of interest.

### Statistical Indicators

The statistical indicators are also single figure descriptors, but provide additional information on the temporal variation of the noise level with time. The indicators are expressed as the sound level exceeded for a specified percentage of the time period of interest and the most commonly used are described below:

$L_{A90, T}$ : the A-weighted noise level exceeded for 90% of the time period T. This indicator is representative of the noise level occurring in the absence of short-term events and is used in the UK to represent the background noise level.

$L_{A10, T}$ : the A-weighted noise level exceeded for 10% of the time period T. This indicator is used in the UK to define traffic noise, although in PPG 24 the  $L_{Aeq, T}$  is used. For freely flowing continuous traffic, the  $L_{Aeq, T}$  is approximately 3 dB lower than the  $L_{A10, T}$ .

$L_{A1, T}$ : the A-weighted noise level exceeded for 1% of the time period T. This indicator is representative of any short-term peaks that occur in the time period.

$L_{Amax, T}$ : the maximum A-weighted noise level that occurred during the time period T. It usually includes an additional subscript, slow (s) or fast (f), ie  $L_{Amax, slow, T}$  or  $L_{Amax, fast, T}$  which denotes the response time used in the analysis algorithm. The fast response tracks the maximum level of a rapidly changing sound more accurately than the slow response and the value is generally higher for impulsive or transient sounds.

$L_{Amin, T}$ : the minimum A-weighted sound level occurring in the time period T, expressed in a similar way to the  $L_{Amax, T}$ .

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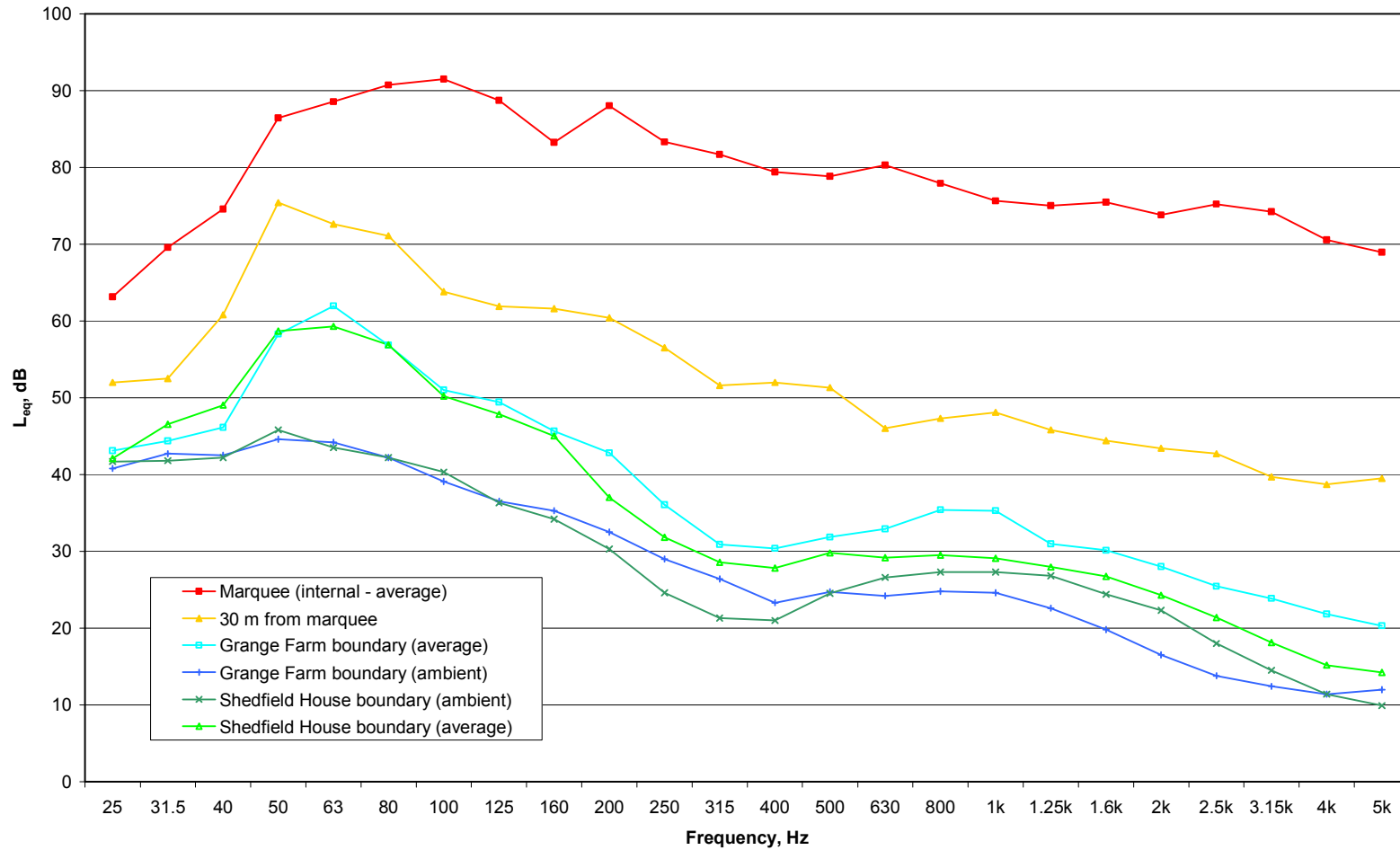


FIGURE 2: Measured noise levels