

# Langstone Technology Park Langstone Road Havant, PO9 1SA

**Preliminary Planning Compliance Review  
Report 18980.PPCR.01 Rev. D**

**AG Langstone B.V and Trinity Investment Management  
St. Christopher's House  
27 St Christopher's  
London  
W1U 1NZ**

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| Revision History                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                   |                                           |                                                  |                                                 |  |
| Report 18980.PPCR.01 Rev. D                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                   |                                           |                                                  |                                                 |  |
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| B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 24/06/2019 – Section 1.0 updated  | E                                         |                                                  |                                                 |  |
| C                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 27/06/2019 – Section 5.0 updated  | F                                         |                                                  |                                                 |  |
| Written by:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                   | Checked by:                               |                                                  | Approved by:                                    |  |
| Gonçalo Lemos MIEEnvSc MIOA<br>Acoustic Consultant                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                   | Aidan Tolkien MIOA<br>Acoustic Consultant |                                                  | Kyriakos Papanagiotou MIOA<br>Managing Director |  |
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### List of Attachments

|                                |                                                              |
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| 18980. TH1-2                   | Environmental Noise Time Histories                           |
| 18980.Daytime.LA90-MP.1-2      | Statistical analysis for representative daytime $L_{A90}$    |
| 18980.Night-time.LA90 – MP.1-2 | Statistical analysis for representative night-time $L_{A90}$ |
| Appendix A                     | Glossary of Acoustics Terminology                            |

## 1.0 INTRODUCTION

KP Acoustics Ltd has been commissioned AG Langstone B.V and Trinity Investment Management, to undertake a baseline noise survey due to a proposed erection of new industrial units at Langstone Technology Park, Langstone Road, Havant, PO9 1SA.

The applicant seeks full planning permission for the part-demolition of Building 1000, installation of a new flank elevation to the East, a new elevation to the North of Building 4000 as a result of the aforementioned part-demolition of Building 1000, the erection of new buildings in flexible B1c, B2 and B8 use in the South-West corner of the site with associated parking; and the creation of new car parking areas and the rationalisation of existing parking areas.

Environmental noise surveys have been undertaken on site in order to be used as baseline noise levels for each of the future industrial units' occupants. Therefore, any potential noise generated from the proposed industrial units' operations and/or external plant installation should be assessed in accordance with BS4142:2014 'Method for rating and assessing industrial *and commercial sound*', to ensure no adverse impact on existing residential receivers.

## 2.0 SITE SURVEYS

### 2.1 Site Description

As shown in Figure 2.1, the site is bounded by Havant Bypass (A27) to the North, existing industrial units and a wastewater treatment plant to the West, industrial units to the South, and residential properties to the East. Entrance to the site is located on Langstone Road and Brookside Road.



**Figure 2.1 Indicative Site Location Plan (Image Source: Google Maps)**

Initial inspection of the site revealed that the background noise profile at the monitoring locations was dominated by road traffic noise from the Havant Bypass (A27) and Langstone Road.

## 2.2 Environmental Noise Survey Procedure

Continuous automated monitoring was undertaken for the duration of the noise survey between 13:24 on 12/04/2019 and 12:04 on 16/04/2019 at monitoring position 1 and between 13:16 on 12/04/2019 and 13:01 on 16/04/2019 at monitoring position 2.

The measurement positions are described in Table 2.1 and shown in Figure 2.2, with the noise data presented in Section 3.1.

| Icon | Descriptor                          | Location Description                                                                                                     |
|------|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
|      | Noise Measurement Position 1 (MP.1) | The microphone was installed on an extendable pole at approximately 3 metres above ground level in free field conditions |
|      | Noise Measurement Position 2 (MP.2) | The microphone was installed on an extendable pole at approximately 3 metres above ground level in free field conditions |

| Icon                                                                              | Descriptor                                   | Location Description                                                                                                                                              |
|-----------------------------------------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | Identified Closest Noise Sensitive Receivers | Identified residential properties located to the East of the proposed new industrial units development, at approximately 170 metres away, as shown in Figure 2.2. |

**Table 2.1 Measurement position and description**

The choice of these positions were based both on accessibility and on collecting representative noise data in relation to the nearest noise sensitive receivers relative to the proposed new industrial units and external plant installation.

Weather conditions were generally dry with light winds and therefore suitable for the measurement of environmental noise. The measurement procedure complied with ISO 1996-2:2007 Acoustics '*Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels*'.

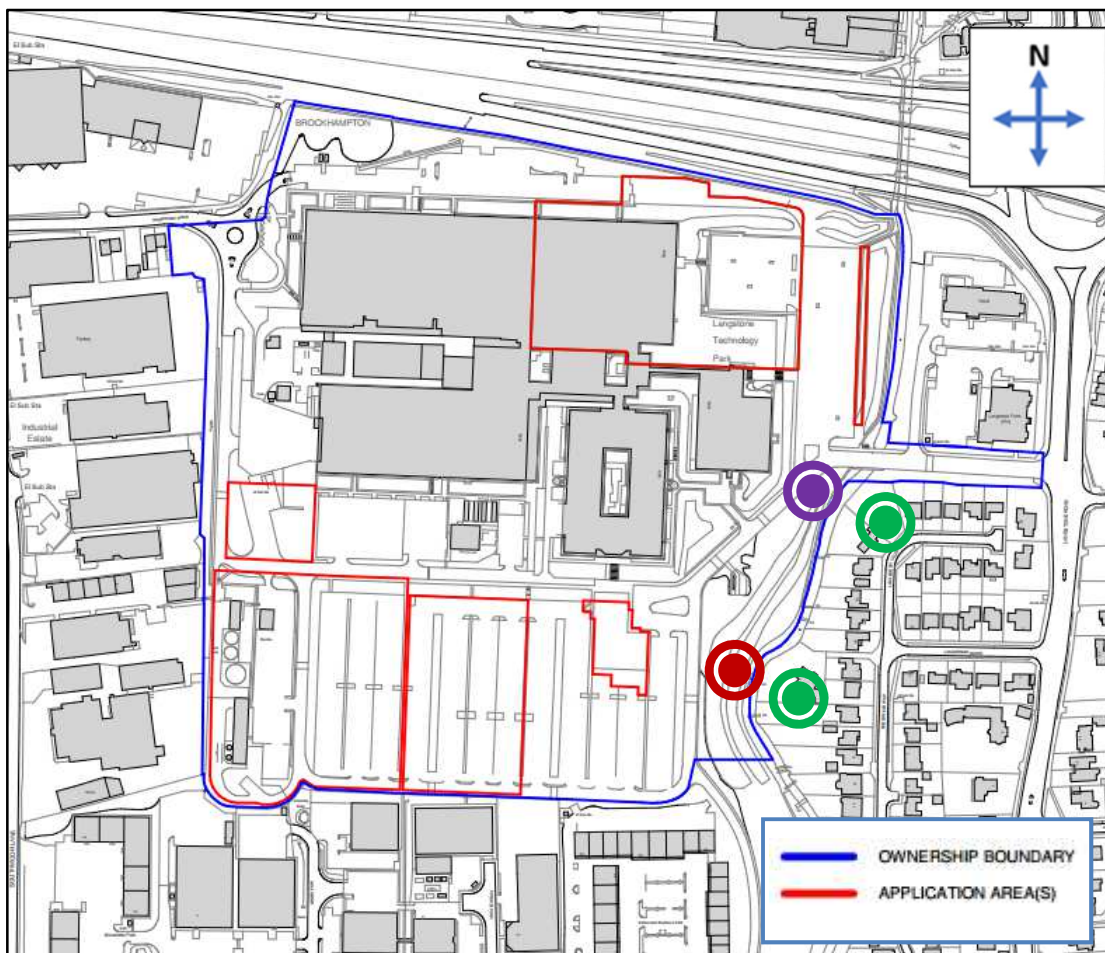


**Figure 2.2 – Site measurement position and identified closes receivers (Drawing Source: AWW inspired environments)**

## 2.3 Equipment

The equipment calibration was verified before and after use and no abnormalities were observed. The equipment used is described within Table 2.3.

| Measurement instrumentation      |                                             | Serial no. | Date       | Cert no.           |
|----------------------------------|---------------------------------------------|------------|------------|--------------------|
| Kit 3                            | Svantek Type 958A Class 1 Sound Level Meter | 59559      | 20/07/2017 | Factory Calibrated |
|                                  | MTG MK250 Free-field microphone             | 70601      |            |                    |
|                                  | Preamp Svantek SV12L                        | 33619      |            |                    |
|                                  | Svantek External windshield                 | N/A        | N/A        | N/A                |
| Kit 12                           | Svantek Type 977A Class 1 Sound Level Meter | 59632      | 21/09/2017 | Factory Calibrated |
|                                  | Free-field microphone Aco Pacific 7052E     | 67603      |            |                    |
|                                  | Preamp Svantek 2v12L                        | 64847      |            |                    |
|                                  | Svantek External windshield                 | -          | -          | -                  |
| B&K Type 4231 Class 1 Calibrator |                                             | 2147411    | 04/02/2019 | 04130/1            |

**Table 2.3 Measurement instrumentation**

## 3.0 RESULTS

### 3.1 Environmental Noise Survey

The  $L_{Aeq}$ : 5min,  $L_{Amax}$ : 5min,  $L_{A10}$ : 5min and  $L_{A90}$ : 5min acoustic parameters were measured throughout the duration of the survey. Measured levels are shown as a time history in Figures 18980.TH1-2.

Measured noise levels are representative of noise exposure levels to be experienced on site, and are shown in Table 3.1.

| Time Period                | Noise Measurement Position 1<br>Measured Noise level – dB(A) | Noise Measurement Position 2<br>Measured Noise level – dB(A) |
|----------------------------|--------------------------------------------------------------|--------------------------------------------------------------|
| Daytime $L_{Aeq,16hour}$   | 57                                                           | 55                                                           |
| Night-time $L_{Aeq,8hour}$ | 52                                                           | 49                                                           |

**Table 3.1 Site average noise levels for daytime and night time**

Representative background noise levels are shown in Table 3.2 for daytime and night-time for each of the monitoring position location.

It should be noted that the representative background noise level has been derived from the most commonly occurring  $L_{A90,5 \text{ min}}$  levels measured during the environmental noise survey undertaken on site, as shown in Figures 18980.Daytime.LA90-MP1-2 and 18980.Night-time.LA90-MP1-2 attached.

| Time Period                       | Noise Measurement Position 1<br>Representative background noise level $L_{A90}$ dB(A) | Noise Measurement Position 2<br>Representative background noise level $L_{A90}$ dB(A) |
|-----------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Daytime $L_{Aeq,16\text{hour}}$   | 54                                                                                    | 50                                                                                    |
| Night-time $L_{Aeq,8\text{hour}}$ | 40                                                                                    | 40                                                                                    |

**Table 3.2 Representative background noise levels.**

## 4.0 NOISE ASSESSMENT GUIDANCE

### 4.1 BS4142: 2014 'Methods for rating and assessing industrial and commercial sound'

British Standard BS4142:2014 '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.

This Standard compares the Rating Level due to the noise source/s under assessment for a one-hour period during the daytime (07:00 – 23:00 hours) and a fifteen-minute period during the night-time (23:00 – 07:00 hours) with the existing background noise level in terms of an  $L_{A90}$  when the noise source is not operating.

It should be noted that the Rating Level is the Specific Sound Level in question ( $L_{Aeq, Tr}$ ), including any relevant acoustic feature corrections, as follows:

- **Tonality** – 'For sound ranging from not tonal to prominently tonal the Joint Nordic Method gives a correction of between 0dB and +6dB for tonality. Subjectively, this

*can be converted to a penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible, and 6dB 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 converted to a penalty of 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it is clearly perceptible, and 9dB where it is highly perceptible'*
- **Intermittency** – *'If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied'*
- **Other sound characteristics** – *'Where the specific sound features characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied'*

Once the Rating Level has been obtained, the representative background sound level is subtracted from the Rating Level to obtain an initial estimate of the impact, as follows:

- 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 or significant 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

*NOTE: Adverse impacts may include but not be limited to annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.*

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

We would suggest that the following rating level acceptability range is followed, considering the context of the environment within which the plant installation and industrial units will be installed.

| Assessment Location                                    | Rating Level Acceptability Range                        |                                                                                                                                                                  |                                                              |
|--------------------------------------------------------|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
|                                                        | Green: noise is considered to be at an acceptable level | Amber: noise is observed to have an adverse effect level, but which may be considered acceptable when assessed in the context of other merits of the development | Red: noise is observed to have a significant adverse effect. |
| 1m Outside living or dining or Bedroom window (façade) | 10dB below background                                   | 9 dB below and 5dB above background                                                                                                                              | 5dB above background                                         |

**Table 4.1 Noise criteria for plant, machinery and industrial units operations.**

## 5.0 NOISE IMPACT ASSESSMENT

Currently, there is no indication of the proposed external plant installation, type of use/operations and hours of operation of the proposed new industrial units.

The measured representative background noise levels on site will serve as a baseline for each of the future industrial units, during the daytime and night-time periods.

It is understood that the closest residential receivers are located to the East and at a minimum distance of 170 metres away from the new industrial units. For indicative purposes only, a scenario where the proposed plant installation and industrial units are operating simultaneously only during the daytime period (07:00-23:00) will be considered. Table 5.1 shows an indicative BS4142 assessment for all proposed plant and industrial units operating simultaneously.

| BS4142 Assessment (for indicative purposes only)     |                                                  |                                                                                                                                                                                                                            |
|------------------------------------------------------|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Source:                                              | Proposed plant and industrial units operations   |                                                                                                                                                                                                                            |
| Operating Period:                                    | Daytime                                          |                                                                                                                                                                                                                            |
| Reference time interval ( $T_r$ ):                   | 1 h                                              |                                                                                                                                                                                                                            |
| Receiver:                                            | Closest residential receiver located to the East |                                                                                                                                                                                                                            |
| Element                                              | Level (dB)                                       | Comment                                                                                                                                                                                                                    |
| Overall Specific Sound Level<br>$L_s = L_{Aeq, T_r}$ | 71                                               | Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, $T_r$ .<br>In this case, an overall specific sound level will |

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       |                                                                                                                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |       | be taken into consideration as being the overall noise level from all plant and industrial units operating simultaneously, without considering appropriate corrections for attenuation due to distance, reflections, and any screening or proposed mitigation.                                                                                                                                                 |
| Correction due to distance (minimum 170 metres)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | -45dB | Specific noise level considering appropriate corrections for attenuation due to distance.                                                                                                                                                                                                                                                                                                                      |
| Representative Background Noise Level<br>$L_{A90, T}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 54    | Sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, $T$ . Derived using the most common occurring levels $L_{A90, 5min}$ during the environmental noise survey undertaken at monitoring position 1.                                                                                                                                       |
| Acoustic Feature Corrections                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | +18   | It is very unlikely that tonality and impulsivity will be highly perceptible at the closest noise sensitive receiver. However, for the purpose of this assessment a worst-case scenario will be assumed. Therefore, a +6dB correction for tonality (highly perceptible at receiver), +9dB correction for impulsivity (highly perceptible at receiver) and a +3dB correction for intermittency will be applied. |
| Rating Level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 44    | Rating Level = Specific Sound Level + Acoustic Feature Corrections                                                                                                                                                                                                                                                                                                                                             |
| Excess of rating over background sound level                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | -10   | The rating level at the receiver is 10dB below the representative background noise level                                                                                                                                                                                                                                                                                                                       |
| <b>Assessment Indication</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |       |                                                                                                                                                                                                                                                                                                                                                                                                                |
| <p>The assessment indicates that an adverse impact on the receiver will be very unlikely and therefore, noise is considered to be at an acceptable level.</p> <p>Furthermore, as the indicative rating level is 10dB below the representative background noise level, it is expected that the noise emissions from the proposed plant and industrial unit operations would be masked by the existing background noise levels during the Daytime period.</p> <p>It should be noted that in order to achieve the subsequent rating level shown in the assessment above, no noise control strategy would need to be adopted.</p> |       |                                                                                                                                                                                                                                                                                                                                                                                                                |

**Table 5.1 Indicative BS4142 assessment**

However, further calculations would need to be undertaken, in accordance with BS4142, once the potential external plant installation and type of use/operations and operating hours of each of the future industrial units are finalised in order to demonstrate planning compliance to the criterion, as shown in section 4.1.

It is usually possible to achieve the recommended criteria as per BS4142, however the addition of some mitigation measures, such as acoustic enclosures or barriers, may be

necessary. The definition of a noise control strategy will be finalised, once all plant units and their installation locations are also finalised.

We would therefore recommend the following wording for the relevant planning Condition, in order to satisfy the project's practical constraints, based on the numerical assessment shown in Table 5.1:

*"The external sound level emitted from plant, machinery or equipment at the development shall be equal or lower than the representative background sound level, with noise levels assessed (if necessary) in accordance with BS4243:2014 at the nearest and/or most affected noise sensitive premises."*

## 6.0 CONCLUSION

An environmental noise survey has been undertaken at Langstone Technology Park, 2B Langstone Road, Havant, PO9 1SA, by KP Acoustics Ltd between 13:24 on 12/04/2019 and 12:04 on 16/04/2019 at monitoring position 1 and between 13:16 on 12/04/2019 and 13:01 on 16/04/2019 at monitoring position 2. The results of the surveys have enabled a representative background noise level to be established.

An assumed specific noise level and subsequent rating level was compared with the representative background noise level to assess the likelihood of impact considering the environmental noise context of the area as per the requirements of BS4142:2014.

It has been concluded that the overall specific sound level of 71dB(A) from all proposed plant and industrial operating simultaneously, would not have an adverse impact on the nearest residential receivers.

Further calculations would need to be undertaken once the potential external plant installations proposals and type of use/operations and operating hours of each of the future industrial units are finalised in order to demonstrate compliance.

Langstone Technology Park, 2B Langstone Road, Havant, PO9 1SA  
Environmental Noise Time History  
From 12 April 2019 To 16 April 2019

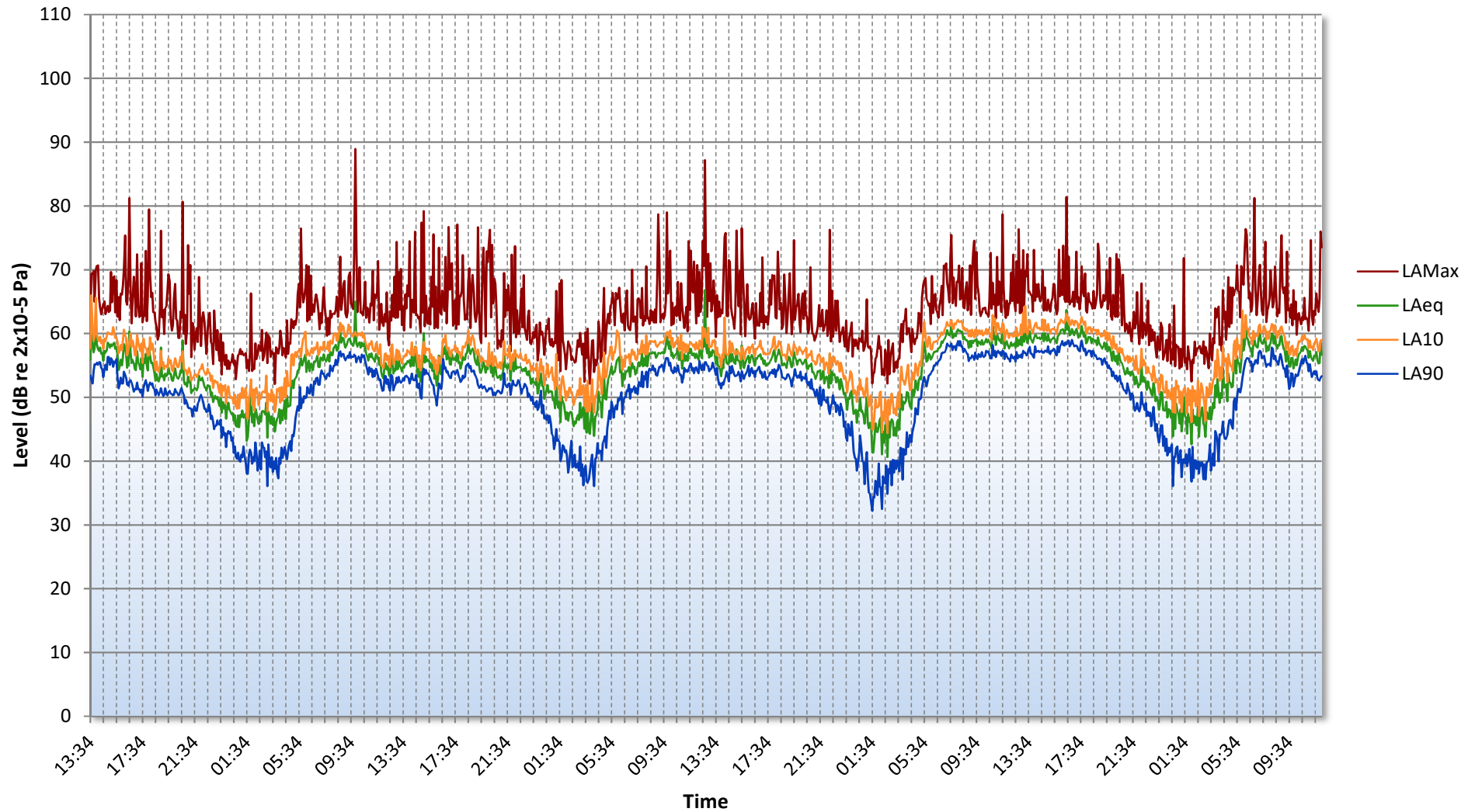


Figure 18980.TH1

Langstone Technology Park, 2B Langstone Road, Havant, PO9 1SA  
Environmental Noise Time History  
From 12 April 2019 To 16 April 2019

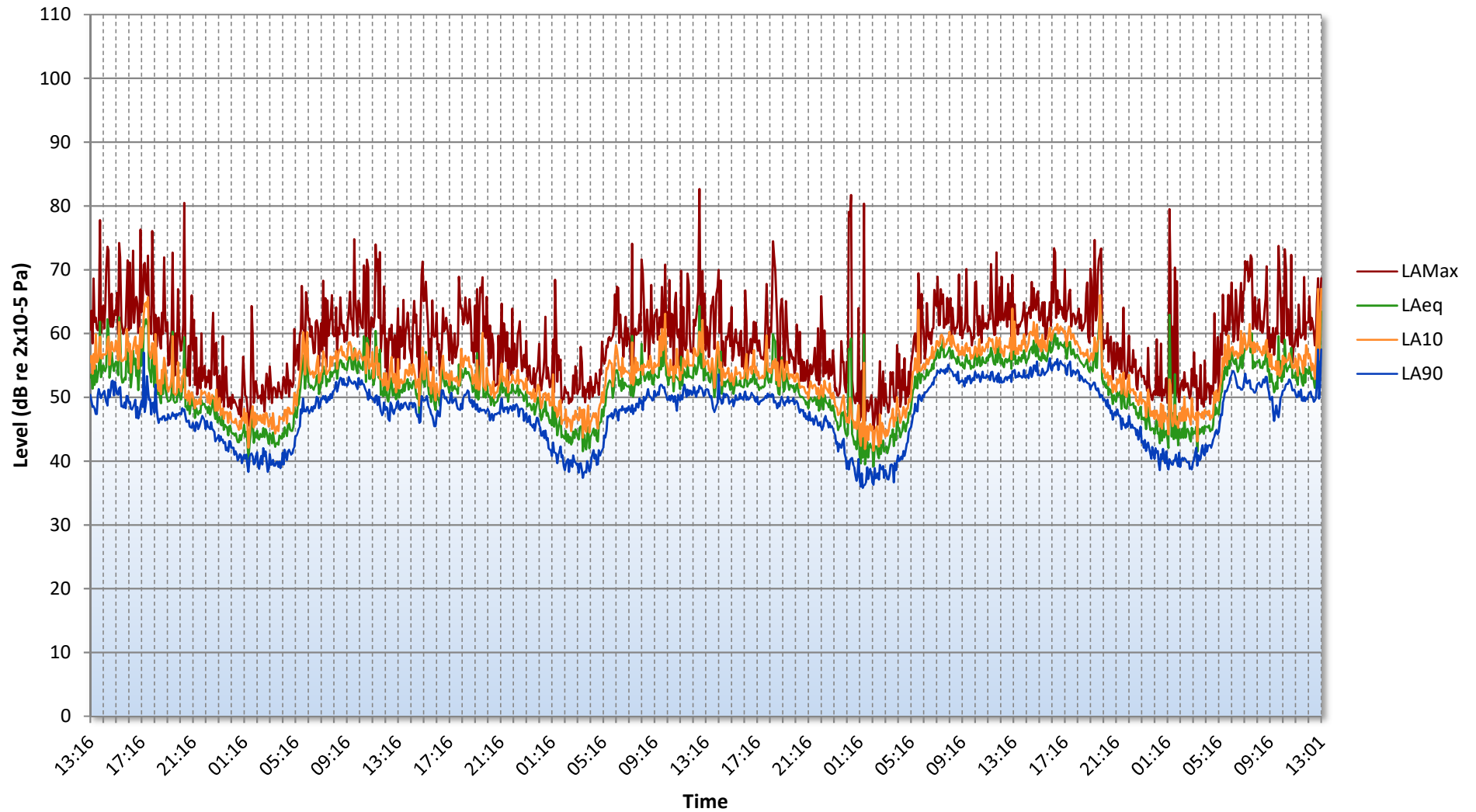


Figure 18980.TH2

Langstone Technology Park, 2B Langstone Road, Havant, PO9 1SA  
Representative Daytime Background Noise Level  
From 12 April 2019 To 16 April 2019

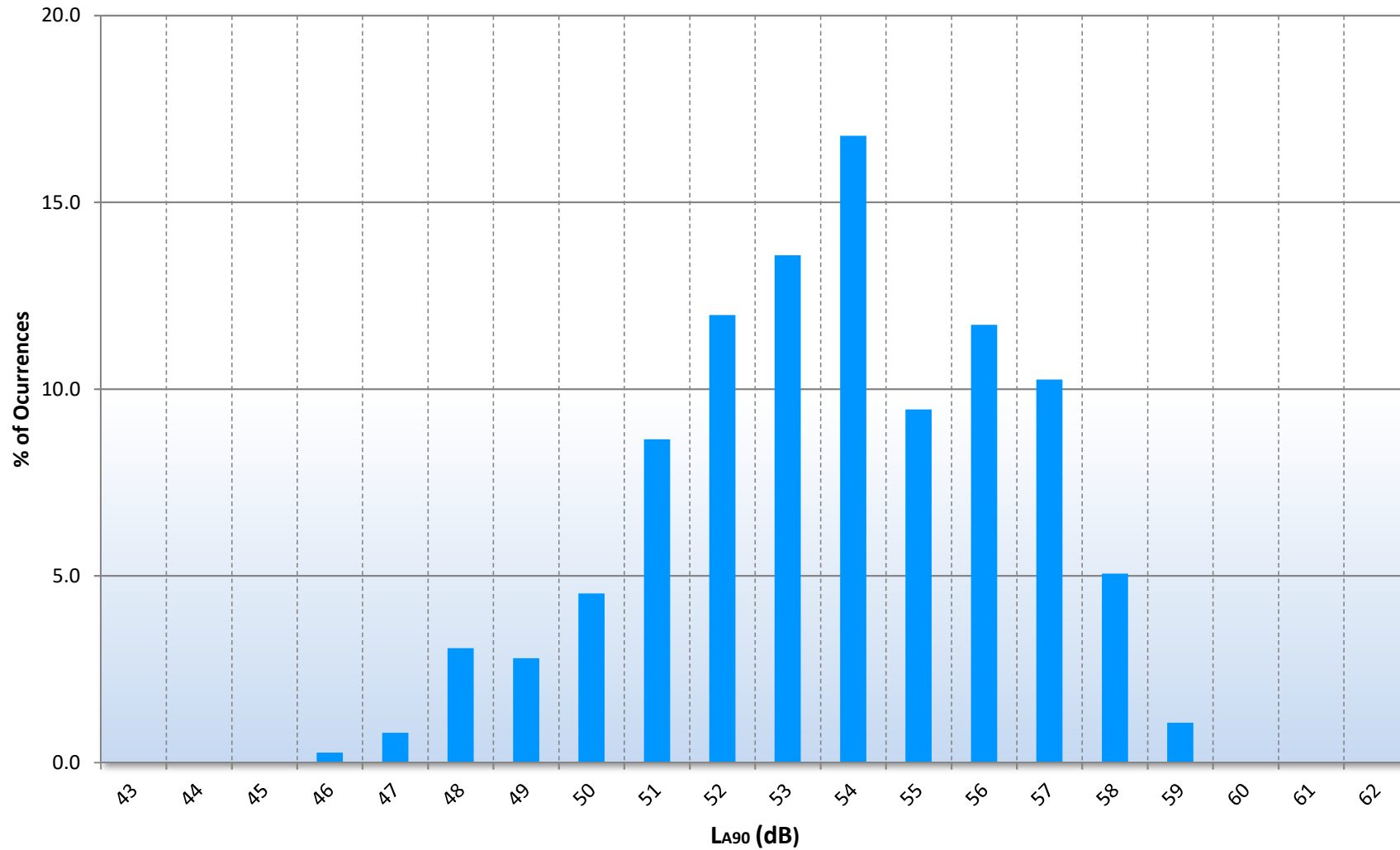


Figure 18980.L90 - MP.1

Langstone Technology Park, 2B Langstone Road, Havant, PO9 1SA  
Representative Daytime Background Noise Level - MP.2  
From 12 April 2019 To 16 April 2019

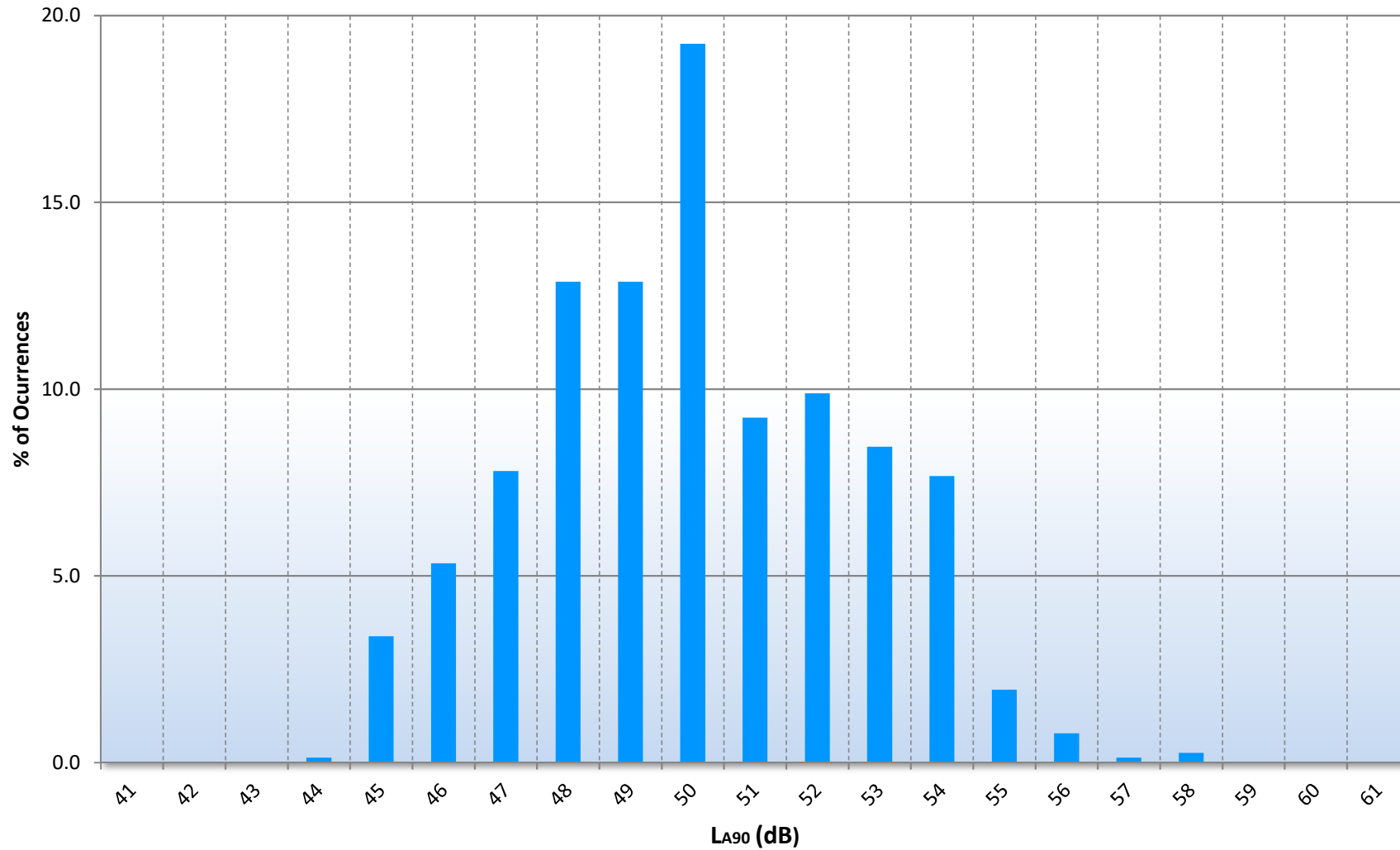


Figure 18980.L90 - MP.2

Langstone Technology Park, 2B Langstone Road, Havant, PO9 1SA  
Representative Night-time Background Noise Level  
From 12 April 2019 To 16 April 2019

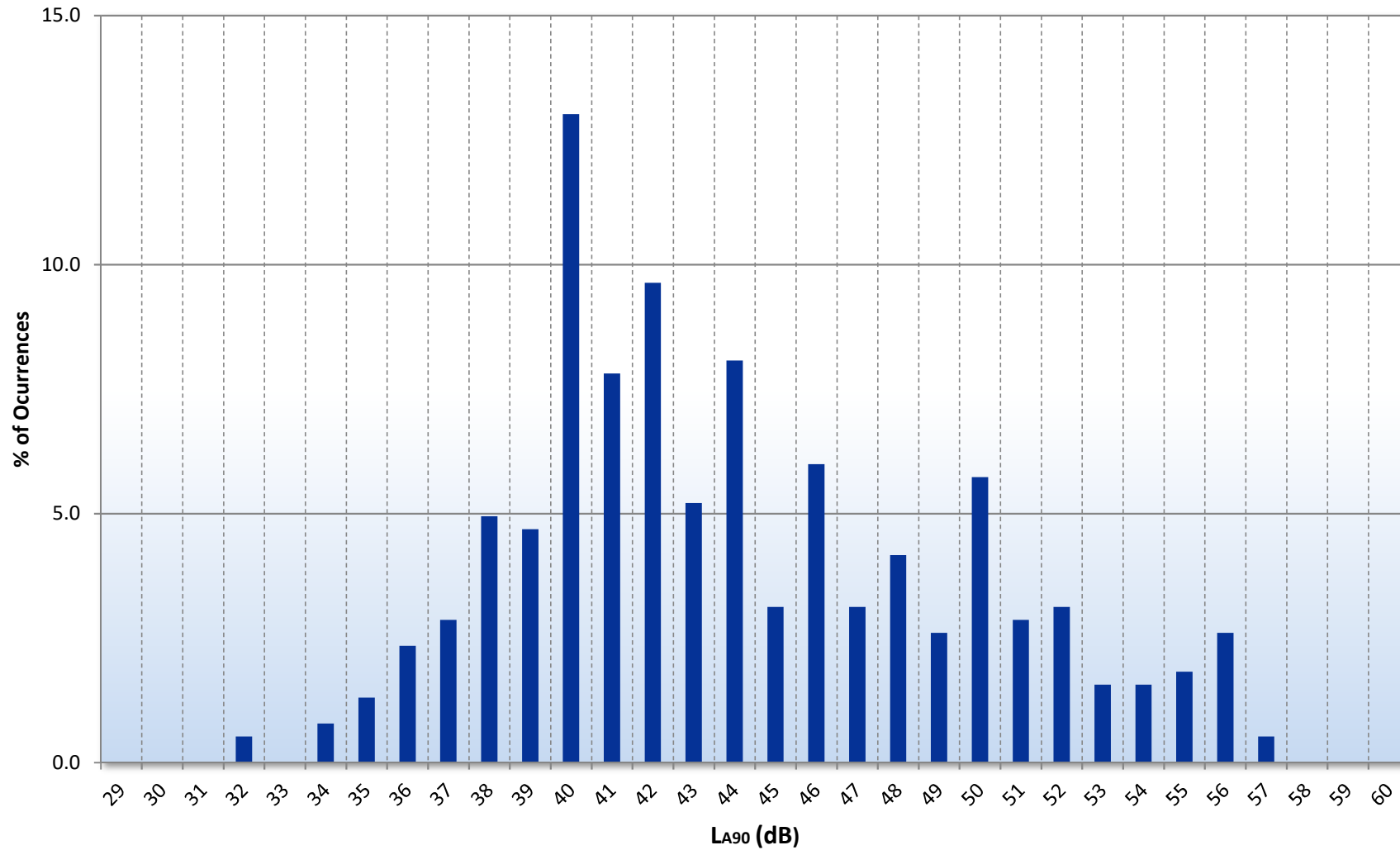


Figure 18980.L90 - MP.1

Langstone Technology Park, 2B Langstone Road, Havant, PO9 1SA  
Representative Night-time Background Noise Level- MP.2  
From 12 April 2019 To 16 April 2019

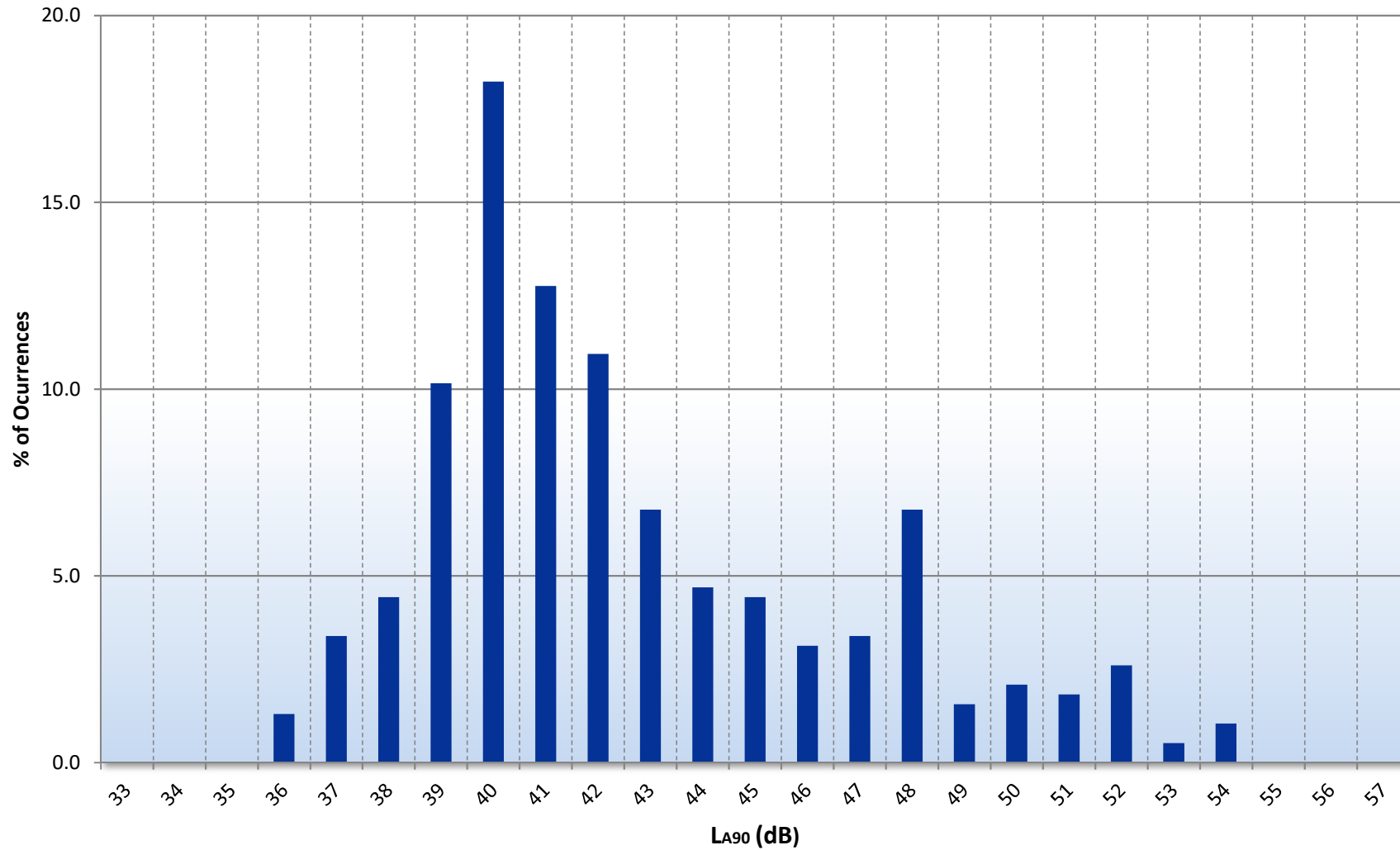


Figure 18980.L90 - MP.2

## GENERAL ACOUSTIC TERMINOLOGY

### Decibel scale - dB

In practice, when sound intensity or sound pressure is measured, a logarithmic scale is used in which the unit is the 'decibel', dB. This is derived from the human auditory system, where the dynamic range of human hearing is so large, in the order of  $10^{13}$  units, that only a logarithmic scale is the sensible solution for displaying such a range.

### Decibel scale, 'A' weighted - dB(A)

The human ear is less sensitive at frequency extremes, below 125Hz and above 16Khz. A sound level meter models the ears variable sensitivity to sound at different frequencies. This is achieved by building a filter into the Sound Level Meter with a similar frequency response to that of the ear, an A-weighted filter where the unit is dB(A).

### $L_{eq}$

The sound from noise sources often fluctuates widely during a given period of time. An average value can be measured, the equivalent sound pressure level  $L_{eq}$ . The  $L_{eq}$  is the equivalent sound level which would deliver the same sound energy as the actual fluctuating sound measured in the same time period.

### $L_{10}$

This is the level exceeded for no more than 10% of the time. This parameter is often used as a "not to exceed" criterion for noise.

### $L_{90}$

This is the level exceeded for no more than 90% of the time. This parameter is often used as a descriptor of "background noise" for environmental impact studies.

### $L_{max}$

This is the maximum sound pressure level that has been measured over a period.

### Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 11 such octave bands whose centre frequencies are defined in accordance with international standards. These centre frequencies are: 16, 31.5, 63, 125, 250, 500, 1000, 2000, 4000, 8000 and 16000 Hertz.

Environmental noise terms are defined in BS7445, *Description and Measurement of Environmental Noise*.

## APPLIED ACOUSTIC TERMINOLOGY

### Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than a single source and 4 sources produce a 6dB higher sound level.

### Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

### Subjective impression of noise

Hearing perception is highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a guide to explain increases or decreases in sound levels for many scenarios.

| Change in sound level (dB) | Change in perceived loudness |
|----------------------------|------------------------------|
| 1                          | Imperceptible                |
| 3                          | Just barely perceptible      |
| 6                          | Clearly noticeable           |
| 10                         | About twice as loud          |

### Transmission path(s)

The transmission path is the path the sound takes from the source to the receiver. Where multiple paths exist in parallel, the reduction in each path should be calculated and summed at the receiving point. Outdoor barriers can block transmission paths, for example traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and construction.

### Ground-borne vibration

In addition to airborne noise levels caused by transportation, construction, and industrial sources there is also the generation of ground-borne vibration to consider. This can lead to structure-borne noise, perceptible vibration, or in rare cases, building damage.

### Sound insulation - Absorption within porous materials

Upon encountering a porous material, sound energy is absorbed. Porous materials which are intended to absorb sound are known as absorbents, and usually absorb 50 to 90% of the energy and are frequency dependent. Some are designed to absorb low frequencies, some for high frequencies and more exotic designs being able to absorb very wide ranges of frequencies. The energy is converted into both mechanical movement and heat within the material; both the stiffness and mass of panels affect the sound insulation performance.