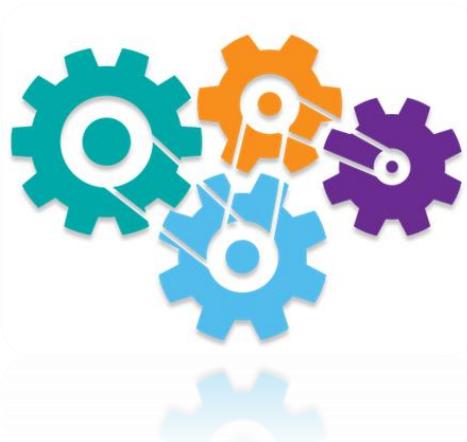




18 Field Heath
Road, UB8
3NF

Noise Impact Assessment

February 2022



Ref: 22-8959

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Quality Standards Control

The signatories below verify that this document has been prepared in accordance with our quality control requirements. These procedures do not affect the content and views expressed by the originator.

This document must only be treated as a draft unless it has been signed by the originators and approved by a director.

<i>Revision</i>	-
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1. Executive Summary

An assessment has been carried out of the present noise climate at **18 Pield Heath Road, UB8 3NF** and the impact of that noise on the proposed development. The proposed scheme involves the construction of a 2.5 storey nursing home to provide 60 rooms.

The site is located in a predominantly residential area. The noise climate of the surrounding area is dominated by road traffic noise along the A437 to the east and Pield Heath Road to the south as well as the surrounding road network.

The assessment is based on the results of a noise measurement survey that has been carried out over a 24-hr period at the proposed development site and has considered the advice of local and national planning policy and best practice guidance.

The initial site risk assessment identified that the site as *medium* risk in terms of noise for facades to the south of the site and *low/medium* risk for facades to the north.

It has been identified that the requirements of the Local Authority in respect of internal noise levels can only be achieved through careful consideration of the building envelope. The construction assumptions that have led to this conclusion are:

- **The façade build-up will be a standard brick and block construction (or equivalent) to achieve an R_w of approximately 55 dB.**
- **For façades that overlook Pield Heath Road:**
 - **A double glazing system in a 6/12/6.4 configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 34 dB R_w .**
 - **Appropriately specified acoustic trickle vents, with a $D_{n,e,w}$ of at least 40 dB, or an alternative means of ventilation will be installed to allow adequate ventilation without the requirement to open windows.**
- **For all other façades:**
 - **A typical double glazing system in a 4/12/6 configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 28 dB R_w .**
 - **Appropriately specified acoustic trickle vents, with a $D_{n,e,w}$ of at least 34 dB, or an alternative means of ventilation will be installed to allow adequate ventilation without the requirement to open windows.**

The assessment has also shown that the external noise level criteria would be achieved in both the resident garden and the second floor terrace area.

Additionally, an initial assessment of plant noise and internal sound insulation has been carried out and it has been identified that adverse impacts can easily be avoided, assuming the criteria identified within this report are achieved.

Overall, it has been shown that, through careful consideration of the building envelope construction, the proposed development should avoid future residents being exposed to harmful levels of noise. It can therefore be concluded that significant adverse impacts on the health or quality of life of those future residents would be avoided, in line with the aims of the NPPF, NPSE and PPG-Noise.

2. Introduction

This report has been prepared to support the planning application for the proposed development at **18 Pield Heath Road, UB8 3NF**. The proposed scheme involves the construction of a 2.5 storey nursing home to provide 60 rooms.

The report assesses, through on-site noise measurements, the impact of the existing noise climate on the proposed development.

A glossary of acoustic terminology is provided in **Appendix 1**.

The site is located in a predominantly residential area. The noise climate of the surrounding area is dominated by road traffic noise along the A437 to the east and Pield Heath Road to the south as well as the surrounding road network. The location of the proposed development site is provided in **Figure 2.1** and the proposed site plan is provided in **Figure 2.2**.



Figure 2.1: Site Location

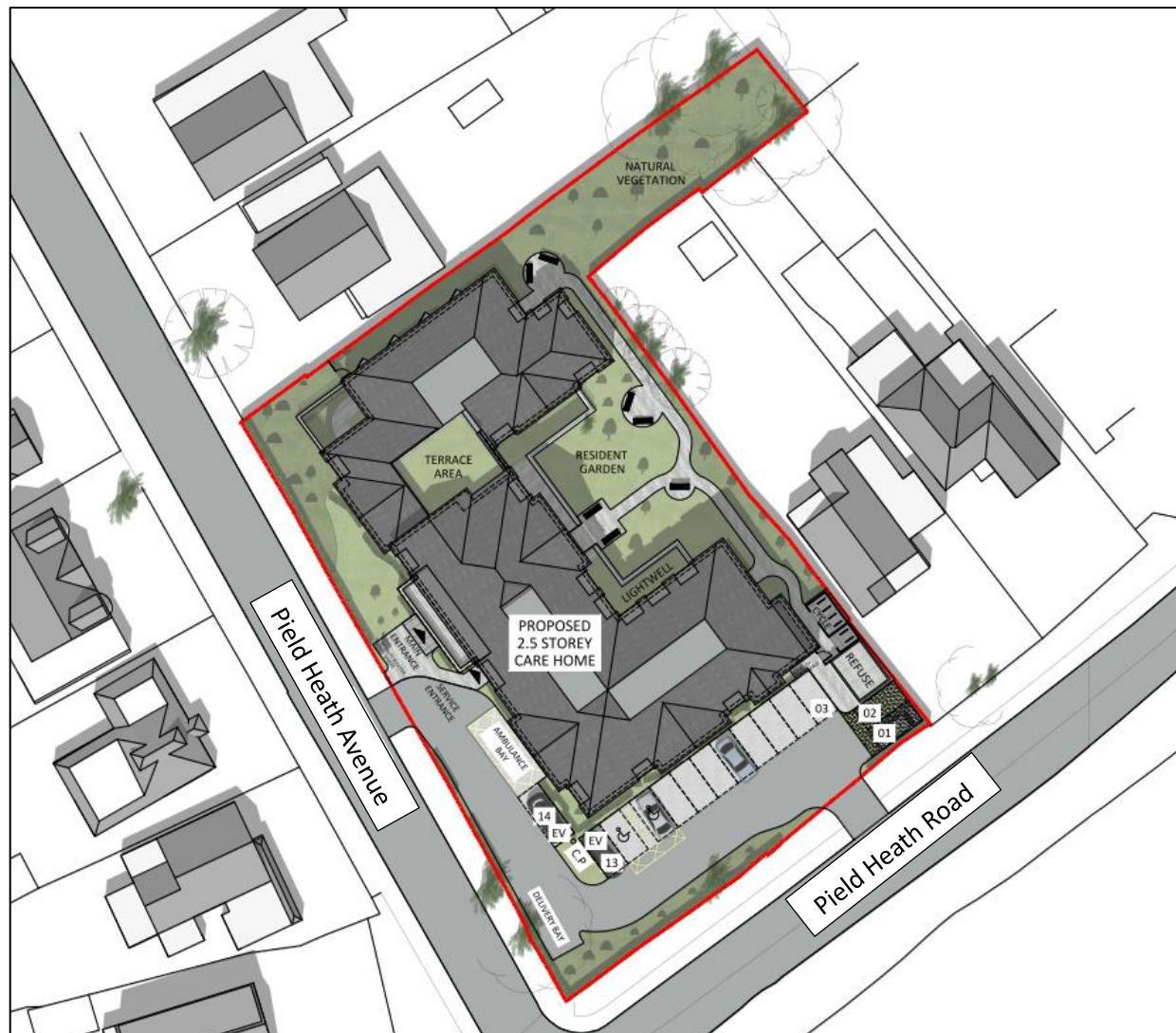


Figure 2.2: Proposed Site Plan

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3. Planning Policy

3.1. National Planning Policy Framework

The National Planning Policy Framework (NPPF) was released in March 2012 and last updated in July 2021. The purpose of the planning system is to contribute to the achievement of sustainable development and to encourage good design. There are three dimensions to sustainable development: economic, social and environmental.

Central to the NPPF, paragraph 10 states: '*At the heart of the National Planning Policy Framework is a presumption in favour of [permitting] sustainable development*'. This is expanded upon in paragraph 11, where it is stated:

'...*For decision-taking this means:*

- *approving development proposals that accord with an up-to-date development plan without delay; or*
- *where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting permission unless:*
 - *the application of policies in this Framework that protect areas or assets of particular importance provides a clear reason for refusing the development proposed; or*
 - *any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in this Framework taken as a whole'*

Paragraph 174 states '*Planning policies and decisions should contribute to and enhance the natural and local environment by... preventing new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of... noise pollution...*'.

Paragraph 185 states: '*Planning policies and decisions should also ensure that 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:*

- *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 (see Explanatory Note to the Noise Policy Statement for England (DEFRA)).*
- *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
- *limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.'*

3.2. Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) aims to '*through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*

- *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'.

3.3. Local Planning Policy

The site is located within the administrative boundary of Hillingdon Council (HC).

HC have set out in their Local Plan Policy EM8 with regards to noise:

"Policy EM8: Land, Water, Air and Noise

Noise

The Council will investigate Hillingdon's target areas identified in the Defra Noise Action Plans, promote the maximum possible reduction in noise levels and will minimise the number of people potentially affected.

The Council will seek to identify and protect Quiet Areas in accordance with Government Policy on sustainable development and other Local Plan policies.

The Council will seek to ensure that noise sensitive development and noise generating development are only permitted if noise impacts can be adequately controlled and mitigated."

The Local Plan also suggests use of EB 46: Noise Supplementary Planning Document – London Borough of Hillingdon, April 2006 for further guidance with regards to noise. This SPD makes reference to PPG24, a document that has largely been superseded by ProPG. As such, Syntegra will utilise the ProPG assessment process (detailed in **Section 4.1**) to demonstrate how adverse impacts will be avoided as this is generally considered to be suitable for most developments. The noise level criteria contained in the ProPG reference BS 8233:2014 and so that criteria will be achieved through the use of the ProPG assessment process. It is noted that care homes do not technically fall under the scope of the ProPG, however, it is common good practice to design care homes to the same standard as normal residential accommodation in terms of noise.

4. Guidance Documents

4.1. Planning Practice Guidance for Noise

The Planning Practice Guidance for Noise (PPG-Noise) was published in March 2014 and last updated in July 2019. The PPG provides advice on how to determine the noise impact on development:

'Plan-making and decision making need to 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.

In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation. As noise is a complex technical issue, it may be appropriate to seek experienced specialist assistance when applying this policy.'

The document goes on to provide a definition for the levels of noise exposure at which an effect may occur:

'Significant observed adverse effect level: this is the level of noise exposure above which significant adverse effects on health and quality of life occur.

Lowest observed adverse effect level: this is the level of noise exposure above which adverse effects on health and quality of life can be detected.

No observed effect level: this is the level of noise exposure below which no effect at all on health and quality of life can be detected.'

It is important to understand that as the PPG-Noise does not provide any advice with respect to specific noise levels/ limits for different sources of noise, it is appropriate to consider other sources of advice and guidance documents when considering whether new developments would be sensitive to the prevailing acoustic environment.

4.2. Professional Practice Guidance on Planning & Noise.

The Professional Practice Guidance (ProPG) on Planning and Noise for New Residential Development was published in May 2017 by the Association of Noise Consultants (ANC), Institute of Acoustics (IOA) and Chartered Institute of Environmental Health (CIEH). The document has been produced to provide practitioners with guidance on a recommended approach to the management of noise within the planning system in England and provides numerical acoustic standards in line with the objectives of the Government's planning and noise policy. As a collaboration between the ANC, IOA and CIEH the document has been designed to encourage a good acoustic design process and aims to protect people from the harmful effects of noise.

The ProPG notes that it '*does not constitute an official government code of practice and neither replaces nor provides an authoritative interpretation of the law or government policy on which users should take their own advice as appropriate*'.

The ProPG advocates a two-stage approach, first providing an initial noise risk assessment of the proposed development site before undertaking a systematic approach to the noise impact assessment. The results of the initial noise risk assessment are an indication as to how detailed the noise impact assessment will need to be in order to satisfactorily assess all acoustic challenges.

4.2.1. Stage 1: Initial Site Noise Risk Assessment

The initial noise risk assessment compares the site noise levels (which can be obtained by measurement or prediction, or a combination of the two, as appropriate) against a risk scale and determines the risk of adverse effects from noise at the site. The purpose of the initial noise risk assessment is to provide an indication of the level of acoustic challenges at the site. In general, the higher the level of risk identified, the greater the level of detail that will be required within the noise impact assessment in order to satisfactorily demonstrate that adverse impacts will be minimised to an acceptable level.

The initial risk assessment and associated notes are provided in Figure 1 of the ProPG and reproduced in **Table 4.1**.

Noise Risk Assessment		Potential Effect Without Noise Mitigation	Pre-Planning Application Advice
Indicative Daytime Noise Levels, L _{Aeq,16hr}	Indicative Night-time Noise Levels, L _{Aeq,8hr}		
70 dB	60 dB		High noise levels indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed Acoustic Design Statement (ADS). Applicants are strongly advised to seek expert advice.
65 dB	55 dB		As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development.
60 dB	50 dB		
55 dB	45 dB		At low noise levels, the site is likely be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.
50 dB	40 dB		
		No adverse effect	These noise levels indicate that the development site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds.

Notes:

- a. Indicative noise levels should be assessed without inclusion of the acoustic effect of any scheme specific noise mitigation measures.
- b. Indicative noise levels are the combined free-field noise level from all sources of transport noise and may also include industrial/commercial noise where this is present but is "not dominant".
- c. L_{Aeq,16hr} is for daytime 0700 hrs – 2300 hrs, L_{Aeq,8hr} is for night-time 2300 hrs – 0700 hrs.

Noise Risk Assessment		Potential Effect Without Noise Mitigation	Pre-Planning Application Advice
Indicative Daytime Noise Levels, $L_{Aeq,16hr}$	Indicative Night-time Noise Levels, $L_{Aeq,8hr}$		
			d. An indication that there may be more than 10 noise events at night (2300 hrs – 0700 hrs) with $L_{Amax,F} > 60$ dB means that the site should not be regarded as negligible risk.

Table 4.1: Stage 1: Initial Site Risk Assessment

Where sites are exposed to industrial or commercial noise that is considered to be “dominant” then an assessment in line with BS 4142:2014 ‘*Methods for rating and assessing industrial and commercial sound*’ should be carried out.

4.2.2. Stage 2: Full Assessment

4.2.2.1. Stage 2: Element 1 – Good Acoustic Design Process

Following a good acoustic design process is an implicit part of achieving good design as required by Government planning and noise policy. It is imperative that acoustic design is considered at an early stage of the development process and the aim should be to avoid “unreasonable” acoustic conditions and prevent “unacceptable” acoustic conditions.

Good acoustic design does not simply mean compliance with the recommended internal and external noise criteria. Instead, an integrated solution should be provided whereby the optimal acoustic outcome is achieved, without design compromises that will adversely affect living conditions and the quality of life of residents or other sustainable design objectives and requirements.

A good acoustic design should consider (in this order):

- *‘Maximising the spatial separation of noise sources and receptors.*
- *Investigating the necessity and feasibility of reducing existing noise levels and relocating existing noise sources.*
- *Using topography and existing structures (that are likely to last the expected life of the noise-sensitive scheme) to screen the proposed development site from significant sources of noise.*
- *Incorporating noise barriers as part of the scheme to screen the proposed development site from significant sources of noise.*
- *Using the layout of the scheme to reduce noise propagation across the site.*
- *Using the orientation of buildings to reduce the noise exposure of noise-sensitive rooms.*
- *Using the building envelope to mitigate noise to acceptable levels.’*

4.2.2.2. Stage 2: Element 2 – Internal Noise Level Guidelines

The ProPG contains Figure 2, which is a table with associated notes drawing on the advice contained within BS 8233:2014 ‘*Guidance on sound insulation and noise reduction for buildings*’, the World Health Organization’s Guidelines for Community Noise 1999 (WHO guidelines) and current best practice. This table is reproduced in **Table 4.2**.

Activity	Location	07:00 – 23:00	23:00 – 07:00
Resting	Living room	35 dB L _{Aeq,16hour}	-
Dining	Dining room/area	40 dB L _{Aeq,16hour}	-
Sleeping (daytime resting)	Bedroom	35 dB L _{Aeq,16hour}	30 dB L _{Aeq,8hour} 45 dB L _{Amax,F} (Note 4)

NOTE 1 The Table provides recommended internal L_{Aeq} target levels for overall noise in the design of a building. These are the sum total of structure-borne and airborne noise sources. Ground-borne noise is assessed separately and is not included as part of these targets, as human response to ground-borne noise varies with many factors such as level, character, timing, occupant expectation and sensitivity.

NOTE 2 The internal L_{Aeq} target levels shown in the Table are based on the existing guidelines issued by the WHO and assume normal diurnal fluctuations in external noise. In cases where local conditions do not follow a typical diurnal pattern, for example on a road serving a port with high levels of traffic at certain times of the night, an appropriate alternative period, e.g. 1 hour, may be used, but the level should be selected to ensure consistency with the internal L_{Aeq} target levels recommended in the Table.

NOTE 3 These internal L_{Aeq} target levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year's Eve.

NOTE 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or L_{Amax,F}, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45 dB L_{Amax,F} more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events.

NOTE 5 Designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic design. Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal L_{Aeq} target levels should not normally be exceeded, subject to the further advice in Note 7.

NOTE 6 Attention is drawn to the requirements of the Building Regulations.

NOTE 7 Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal L_{Aeq} target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved. The more often internal L_{Aeq} levels start to exceed the internal L_{Aeq} target levels by more than 5 dB, the more that most people are likely to regard them as "unreasonable". Where such exceedances are predicted, applicants should be required to show how the relevant number of rooms affected has been kept to a minimum. Once internal L_{Aeq} levels exceed the target levels by more than 10 dB, they are highly likely to be regarded as "unacceptable" by most people, particularly if such levels occur more than occasionally. Every effort should be made to avoid relevant rooms experiencing "unacceptable" noise levels at all and where such levels are likely to occur frequently, the development should be prevented in its proposed form.

Table 4.2: ProPG Internal Noise Level Guidelines

4.2.2.3. Stage 2: Element 3 – External Amenity Area Noise Assessment

The ProPG considers the advice provided within BS 8233:2014 and the PPG-Noise in respect of external amenity areas, and presents the following advice, which is selected from both documents, in order to carry out a full assessment of noise levels:

- i. *'If external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended.'*
- ii. *'The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 –*

55 dB $L_{Aeq,16hr.}'$

- iii. 'These guideline values may not be achievable in all circumstances where development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in these external amenity spaces.'
- iv. 'Whether or not external amenity spaces are an intrinsic part of the overall design, consideration of the need to provide access to a quiet or relatively quiet external amenity space forms part of a good acoustic design process'
- v. 'Where, despite following a good acoustic design process, significant adverse noise impacts remain on any private external amenity space (e.g. garden or balcony) then that impact may be partially off-set if the residents are provided, through the design of the development or the planning process, with access to:
 - A relatively quiet façade (containing openable windows to habitable rooms) or a relatively quiet externally ventilated space (i.e. an enclosed balcony) as part of their dwelling; and/or
 - a relatively quiet alternative or additional external amenity space for sole use by a household, (e.g. a garden, roof garden or large open balcony in a different, protected, location); and/or
 - a relatively quiet, protected, nearby external amenity space for sole use by a limited group of residents as part of the amenity of their dwellings; and/or
 - a relatively quiet, protected, publically accessible, external amenity space (e.g. a public park or a local green space designated because of its tranquillity) that is nearby (e.g. within a 5 minute walking distance). The local planning authority could link such provision to the definition and management of Quiet Areas under the Environmental Noise Regulations.'

4.2.2.4. Stage 2: Element 4 – Assessment of Other Relevant Issues

The final element of Stage 2 is an assessment of 'other relevant issues' and the ProPG suggests that the following issues are considered before making any final conclusions with respect to noise impacts:

- i. 'compliance with relevant national and local policy'
- ii. 'magnitude and extent of compliance with ProPG'
- iii. 'likely occupants of the development'
- iv. 'acoustic design v. unintended adverse consequences'
- v. 'acoustic design v. wider planning objectives'.

The ProPG notes that 'not all of the issues listed above will arise in every planning application and some may already have been addressed as an inherent part of good acoustic design. In addition, LPAs [Local Planning Authorities] may wish to add other relevant issues depending on local circumstances and priorities.'

4.3. British Standard 4142:2014

British Standard 4142:2014 "Methods for rating and assessing industrial and commercial sound" provides a method for the measurement and rating of industrial type noise sources and background noise levels outside dwellings. The rating level (defined in the BS) is used to rate the noise source outside residential dwellings (this is defined as the "specific sound level").

The rating level is determined by assessing the character of the noise and applying an acoustic feature correction if appropriate. Corrections are applied for the tonality and intermittency of the noise source which can both make noise more noticeable.

The initial assessment described in BS 4142 to determine whether an adverse impact is likely is based on establishing the difference between the rating level and the background noise level outside the residential property of interest. The British Standard states that the following points should be considered:

- *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 is likely to 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 the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

5. Baseline Noise Levels

In order to determine the extent to which the site is currently affected by noise, a detailed measurement study has been carried out at the site. Measurements have been carried out in order to characterise the existing noise climate over a 24-hour period. The noise climate of the area was dominated by road traffic noise from Pield Heath Road and the A437 to the east. Some noise from road traffic along Pield Heath Avenue and the surrounding road network was also noted.

The noise measurements utilised two Type 1 Precision Sound Level Meters, a Norsonic 140 and a Svantek 958, both with a current certificate of calibration, the full list of equipment is detailed in **Appendix 3**. Before and after the measurement period the equipment was calibrated in order to ensure that the equipment had remained within reasonable calibration limits (+/- 0.5 dB). Noise Measurements were carried out in consecutive 5 minutes periods with a 1 second resolution.

Measurements were carried out between 1020 hrs on Tuesday 22nd February 2022 and 1030 hrs on Wednesday 23rd February 2022.

During the noise measurement survey, the temperature reached a high of 13°C, dropping to 2°C overnight. There was generally a moderate (3-5 m/s) westerly wind throughout the survey, with occasional stronger gusts. The cloud cover was noted to be 70% at the start of the survey and 20% at the end. Occasional rain showers were noted during the measurement period; however this has not affected the overall results of the noise measurement survey.

Noise measurements were carried out over a 24-hr period at Measurement Position 1 (MP1) in a free-field location to the south of the site, overlooking Pield Heath Road and approximately 4m above ground level. The noise climate at this position was dominated by road traffic along Pield Heath Road, which was approximately 4m horizontally from the measurement position, as well as the A437 to the east.

Noise measurements were carried out over a 24-hr period at Measurement Position 2 (MP2) in a free-field location to the north of the site, overlooking Pield Heath Avenue, approximately 3m above ground level. The noise climate at this location was dominated by road traffic noise from the surrounding road network.

The noise monitoring positions are shown in **Figure 5.1**.



Figure 5.1: Noise Monitoring Location

Table 5.1 below displays a summary of the measured noise levels and detailed measurement results are presented in **Appendix 4**.

Measurement Position	Period (hours)	$L_{Aeq,T}$ (dB)	L_{Amax} (dB)	L_{A90} (dB)
MP1	Daytime (0700 – 2300)	70	91	55
	Night-time (2300 – 0700)	63	81	40
MP2	Daytime (0700 – 2300)	57	81	48
	Night-time (2300 – 0700)	52	70	40

Table 5.1: Summary of Free Field Semi-Permanent Noise Levels

Note: The average noise levels stated are logarithmic for L_{Aeq} . The $L_{Amax,F}$ noise levels stated are the arithmetic average of the hourly noise levels during the daytime (0700 hrs – 2300 hrs) and the 10th highest $L_{Amax,F,5min}$ noise level at night (2300 hrs – 0700 hrs), as noted in Table 4.2.

A distance correction from MP1 (4m from Pield Heath Road) to the nearest façade of the proposed building (approximately 17m from Pield Heath Road), has been applied, as a line source correction for $L_{Aeq,T}$ levels and as a point source correction for L_{Amax} levels in line with normal good acoustic practices.

Assessment Position	Period (hours)	$L_{Aeq,T}$ (dB)	L_{Amax} (dB)
South Façade	Daytime (0700 – 2300)	64	78
	Night-time (2300 – 0700)	56	68

Table 5.2: Distance Corrected Noise Levels from MP1 to South Façade

6. Initial Site Risk Assessment

The initial site risk assessment has been carried out by comparing the results of the noise measurement survey against the criteria presented in **Table 4.1**. The outcome of the initial site risk assessment is presented in **Table 6.1**.

Assessment Position	Daytime Ambient Noise Level $L_{Aeq,16hr}$ (dB)	Initial Noise Risk Assessment (Daytime)	Night-time Ambient Noise Level $L_{Aeq,8hr}$ (dB)	Initial Noise Risk Assessment (Night-time)
South Façade	64	Medium	56	Medium
North Façade (MP2)	57	Low	52	Low/Medium

Table 6.1: Initial Site Risk Assessment

The results of the initial site risk assessment based on the measured noise levels indicate that the site has a *medium* risk in terms of noise for façades overlooking Pield Heath Road and *low/medium* for facades to the north. The pre-application advice associated with these risk categories are:

Medium and Low-Medium: *'As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an Acoustic Design Statement (ADS) which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development.'*

Low: *'At low noise levels, the site is likely be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impact will be mitigated and minimised in the finished development.'*

7. Full Assessment

7.1. Internal Noise Level Assessment

Note 5 of **Table 4.2** suggests that internal noise levels should ideally be achieved in as many properties as possible with windows open. In carrying out our assessment, Syntegra have therefore made the following assumptions:

- The façade build-up will be a standard brick and block construction (or equivalent) to achieve an R_w of approximately 55 dB.
- For façades that overlook Pield Heath Road:
 - A double glazing system in a 6/12/6.4 configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 34 dB R_w .
 - Appropriately specified acoustic trickle vents, with a $D_{n,e,w}$ of at least 40 dB, or an alternative means of ventilation will be installed to allow adequate ventilation without the requirement to open windows.
- For all other façades:
 - A typical double glazing system in a 4/12/6 configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 28 dB R_w .
 - Appropriately specified acoustic trickle vents, with a $D_{n,e,w}$ of at least 34 dB, or an alternative means of ventilation will be installed to allow adequate ventilation without the requirement to open windows.

Table 7.1 identifies the likely L_{Aeq} and L_{Amax} internal noise levels, assuming windows closed, utilising the *Simple Calculation Method* described in BS 8233:2014 for the worst affected façades.

Assessment Location	Period (hrs)	External Noise Levels (dB) (ref. Table 5.2)	Sound Insulation of Glazing (dBA)	Internal Noise Levels (dB)	Compliance with ProPG Criteria
Ambient Noise Level L_{Aeq} (dB)					
South Façade	Daytime (0700 – 2300)	64	34	30	✓
	Night-time (2300 – 0700)	56		22	
North, West and East Façades	Daytime (0700 – 2300)	57	28	29	✓
	Night-time (2300 – 0700)	52		24	
Maximum Noise Level L_{Amax} (dB)					
South Façade	Night-time (2300 – 0700)	68	34	34	✓
North, West and East Façades	Night-time (2300 – 0700)	70	28	42	✓

Table 7.1: Internal Noise Levels

7.2. External Noise Level Assessment

The site layout in **Figure 2.2** above indicates the location of resident gardens to the east of the site and a terrace area on the second floor.

The noise level in the resident garden to the east of the site can be derived from MP1, which, from **Table 5.1**, has a daytime noise level of 70 dB $L_{Aeq,16hr}$ at 4m from Pield Heath Road. The resident garden is likely to be at a distance of approximately 30m from Pield Heath Road and completely screened by the surrounding buildings. A distance correction of -9 dB can therefore be applied, assuming a line source correction and a screening correction of -10 dB can also be applied. Accordingly, daytime noise levels would not be expected to exceed 51 dB $L_{Aeq,16hr}$, which would achieve the upper guideline criterion (55 dB $L_{Aeq,16hr}$) of the ProPG and much of the resident garden would also be likely to achieve the lower guideline criterion (50 dB $L_{Aeq,16hr}$) of the ProPG.

The noise levels on the terrace area can be derived MP2 which, from **Table 5.1**, has a daytime noise level of 57 dB $L_{Aeq,16hr}$. Screening from the surrounding building would be expected to provide at least 10 dB of screening attenuation, with further attenuation expected from a distance correction. As such noise levels in the amenity areas would be expected to be below 47 dB $L_{Aeq,16hr}$, which would readily achieve the lower guideline criterion (50 dB $L_{Aeq,16hr}$) of the ProPG.

It can therefore be safely concluded that the noise climate in external amenity areas should be acceptable.

7.3. Assessment of Other Relevant Issues

The assessment has shown that a reasonable internal noise environment can be achieved, in line with the requirements of the Local Authority, BS 8233 and the ProPG through careful consideration of the building envelope and ventilation requirements. Whilst it would be ideal to achieve the internal level criteria with open windows, it is common to achieve the criteria relying on closed windows in noisier areas. Such as an approach is advocated in the PPG-Noise.

The assessment has also shown that the external noise level criteria would be achieved in both the resident garden and the second floor terrace area.

Overall, it has been shown that, through careful consideration of the building envelope construction, the proposed development should avoid future residents being exposed to harmful levels of noise. It can therefore be concluded that significant adverse impacts on the health or quality of life of those future residents would be avoided, in line with the aims of the NPPF, NPSE and PPG-Noise.

8. Plant Noise Assessment

The precise details of the proposed plant types are not yet available; therefore, the maximum noise level has been derived utilising the background noise level data for the measurement survey presented in **Section 5** (refer to **Appendix 4** for a detailed assessment of background noise levels) and the basic methodologies presented in BS 4142:2014. This derivation is summarised in **Tables 8.1** and **8.2** for Pield Heath Road and Pield Heath Avenue respectively. The aim is to avoid adverse impacts, which is generally accepted as having a rating level no greater than equal to the background noise level.

Results	Daytime (0700 hrs – 2300 hrs)	Night-time (2300 hrs – 0700 hrs)	Relevant Clauses of BS 4142:2014	Commentary
Typical Background Sound Level L_{A90} (dB)	55	40	8.1, 8.2	Refer to Table 5.1 and Appendix 4 .
Required Difference between Rating Level and Background Sound Level	0	0	9.2	LA requirement: Equal to L_{A90}
Rating Level	55	40	9.2	(Specific Sound Level + Acoustic Feature Correction)
Acoustic Feature Correction	Unknown	Unknown	9.2	No acoustic feature correction has been applied to account for the specific acoustic features as the precise plant specifications are unknown.
Specific Sound Level, L_{Aeq} (dB), at 1m from nearest noise sensitive receptor	68	53	7.3.7, 7.3.9, 7.3.11	Derived from the typical background sound level

Table 8.1: Total Sound Level of Plant Equipment – Receptors along Pield Heath Road

Results	Daytime (0700 hrs – 2300 hrs)	Night-time (2300 hrs – 0700 hrs)	Relevant Clauses of BS 4142:2014	Commentary
Typical Background Sound Level L_{A90} (dB)	48	40	8.1, 8.2	Refer to Table 5.1 and Appendix 4 .
Required Difference between Rating Level and Background Sound Level	0	0	9.2	LA requirement: Equal to L_{A90}
Rating Level	48	40	9.2	(Specific Sound Level + Acoustic Feature Correction)
Acoustic Feature Correction	Unknown	Unknown	9.2	No acoustic feature correction has been applied to account for the specific acoustic features as the precise plant specifications are unknown.
Specific Sound Level, L_{Aeq} (dB), at 1m from nearest noise sensitive receptor	61	53	7.3.7, 7.3.9, 7.3.11	Derived from the typical background sound level

Table 8.2: Total Sound Level of Plant Equipment – Receptors on Pield Heath Avenue

It will be important to ensure that the selected plant does not exceed the specific noise levels identified in this section of the report at 1m from the nearest window to a habitable room. If the plant is tonal, intermittent, or contains any other acoustic features, this would reduce the maximum specific noise levels identified in **Tables 8.1** and **8.2**. Careful consideration is required as to the specification and siting of any plant. The total allowable noise level emitted from the plant will increase with distance and shielding from the nearest noise sensitive receptor.

9. Internal Sound Insulation

The sound insulation of walls and floors between adjacent dwellings should be designed to achieve the requirements of the Building Regulations Approved Document E (2010) *Resistance to the passage of sound (ADE)*. For new build properties, the requirements are:

- Airborne Sound Insulation of walls separating dwellings must be at least 45 dB $D_{nT,w} + C_{tr}$.
- Airborne Sound Insulation of floors separating dwellings must be at least 45 dB $D_{nT,w} + C_{tr}$.
- Impact Sound Insulation of floors separating dwelling must not be greater than 62 dB $L'_{nT,w}$.

The sound insulation of the walls and floors between dwellings and non-residential areas (e.g. the lower ground floor) should be assessed in detail as the level of noise that is likely to be produced in the non-residential units will need to be considered. **Typically, a sound insulation rating that is 10 dB better than the requirements of ADE (without the C_{tr} correction, as this is for typical residential noise) should provide sufficient noise reduction, assuming typical noise levels within the non-residential units.** The following sound insulation criteria could therefore be adopted:

- Airborne Sound Insulation of walls should be at least 55 dB $D_{nT,w}$.
- Airborne Sound Insulation of floors should be at least 55 dB $D_{nT,w}$.

As the non-residential areas are located below the proposed dwellings, there is no impact sound insulation criterion.

It is important to note that, as with any construction project, the ability to meet the specification will rely upon the quality of the built structure. As such the works should be carried out to a high standard of workmanship to ensure that any sound insulation measures are not breached, for example by installing a rigid connection across an isolated connection (such as resilient bars or floating floors). Additionally, any joints between different walls and the party wall and the ceiling/floor should be carefully filled with acoustic mastic.

10. Conclusion

An assessment has been carried out of the present noise climate at **18 Pield Heath Road, UB8 3NF** and the impact of that noise on the proposed development.

The assessment is based on the results of a noise measurement survey that has been carried out over a 24-hr period at the proposed development site and has considered the advice of local and national planning policy and best practice guidance.

The initial site risk assessment identified that the site as *medium* risk in terms of noise for facades to the south of the site and *low/medium* risk for facades to the north.

It has been identified that the requirements of the Local Authority in respect of internal noise levels can only be achieved through careful consideration of the building envelope. The construction assumptions that have led to this conclusion are:

- **The façade build-up will be a standard brick and block construction (or equivalent) to achieve an R_w of approximately 55 dB.**
- **For façades that overlook Pield Heath Road:**
 - A double glazing system in a 6/12/6.4 configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 34 dB R_w .
 - Appropriately specified acoustic trickle vents, with a $D_{n,e,w}$ of at least 40 dB, or an alternative means of ventilation will be installed to allow adequate ventilation without the requirement to open windows.
- **For all other façades:**
 - A typical double glazing system in a 4/12/6 configuration (or equivalent) will be installed to give a Sound Reduction Index (SRI) of 28 dB R_w .
 - Appropriately specified acoustic trickle vents, with a $D_{n,e,w}$ of at least 34 dB, or an alternative means of ventilation will be installed to allow adequate ventilation without the requirement to open windows.

The assessment has also shown that the external noise level criteria would be achieved in both the resident garden and the second floor terrace area.

Additionally, an initial assessment of plant noise and internal sound insulation has been carried out and it has been identified that adverse impacts can easily be avoided, assuming the criteria identified within this report are achieved.

Overall, it has been shown that, through careful consideration of the building envelope construction, the proposed development should avoid future residents being exposed to harmful levels of noise. It can therefore be concluded that significant adverse impacts on the health or quality of life of those future residents would be avoided, in line with the aims of the NPPF, NPSE and PPG-Noise.

11. Appendix 1: Glossary of Acoustic Terminology

Term	Description
'A'-Weighting	<i>This is the main way of adjusting measured sound pressure levels to take into account human hearing, and our uneven frequency response.</i>
Decibel (dB)	<i>This is a tenth (deci) of a bel. The decibel can be a measure of the magnitude of sound, changes in sound level and a measure of sound insulation. Decibels are not an absolute unit of measurement but are an expression of ratio between two quantities expressed in logarithmic form.</i>
$L_{Aeq,T}$	<i>The equivalent steady sound level in dB containing the same acoustic energy as the actual fluctuating sound level over the given period, T. T may be as short as 1 second when used to describe a single event, or as long as 24 hours when used to describe the noise climate at a specified location. $L_{Aeq,T}$ can be measured directly with an integrating sound level meter.</i>
L_{A10}	<i>The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 10 per cent of a given time and is the L_{A10T}. The L_{A10} is used to describe the levels of road traffic noise at a particular location.</i>
L_{A50}	<i>The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 50 per cent of a given time and is the L_{A50T}.</i>
L_{A90}	<i>The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 90 per cent of a given time and is the L_{A90T}. The L_{A90} is used to describe the background noise levels at a particular location.</i>
L_{Amax}	<i>The 'A'-weighted maximum sound pressure level measured over a measurement period.</i>

12. Appendix 2: Professional Statement

David Yates

David Yates is a full member of the Institute of Acoustics (MIOA) and has over ten years' experience in acoustic consultancy. David has particular expertise in environmental noise providing acoustic consultancy for residential and mixed use planning applications, plant noise and vibration, construction noise and the design of acoustic, noise and vibration control. David is also experienced in providing sound insulation testing and design advice. David is familiar with the application of all relevant standards associated with his work, including but not limited to, BS 4142, BS 8233, BS 7445, BS 6472, BS 5228, BS 140 series, BS 16283 series and BS 717 series. David manages the acoustic department and is responsible for maintaining Syntegra's ANC membership.

13. Appendix 3: List of Equipment

Equipment Type	Manufacturer	Serial Number	Calibration Certification Number	Date of Last Calibration Check
Nor-140 Type 1 Sound Level Meter	Norsonic	1406389	TCRT21/1767	November 2021
Nor-1225 Microphone	Norsonic	225519	TCRT21/1767	November 2021
Nor-1209 Preamplifier	Norsonic	20598	TCRT21/1767	November 2021
Nor-1251 Sound Calibrator	Norsonic	35115	TCRT21/1761	November 2021
SVAN 958	Svantek	92843	<i>No certificate number provided</i>	February 2021
MK 255 Microphone	Microtech Gefell	20197	<i>No certificate number provided</i>	February 2021
SV12L Preamplifier	Svantek	106885	<i>No certificate number provided</i>	February 2021

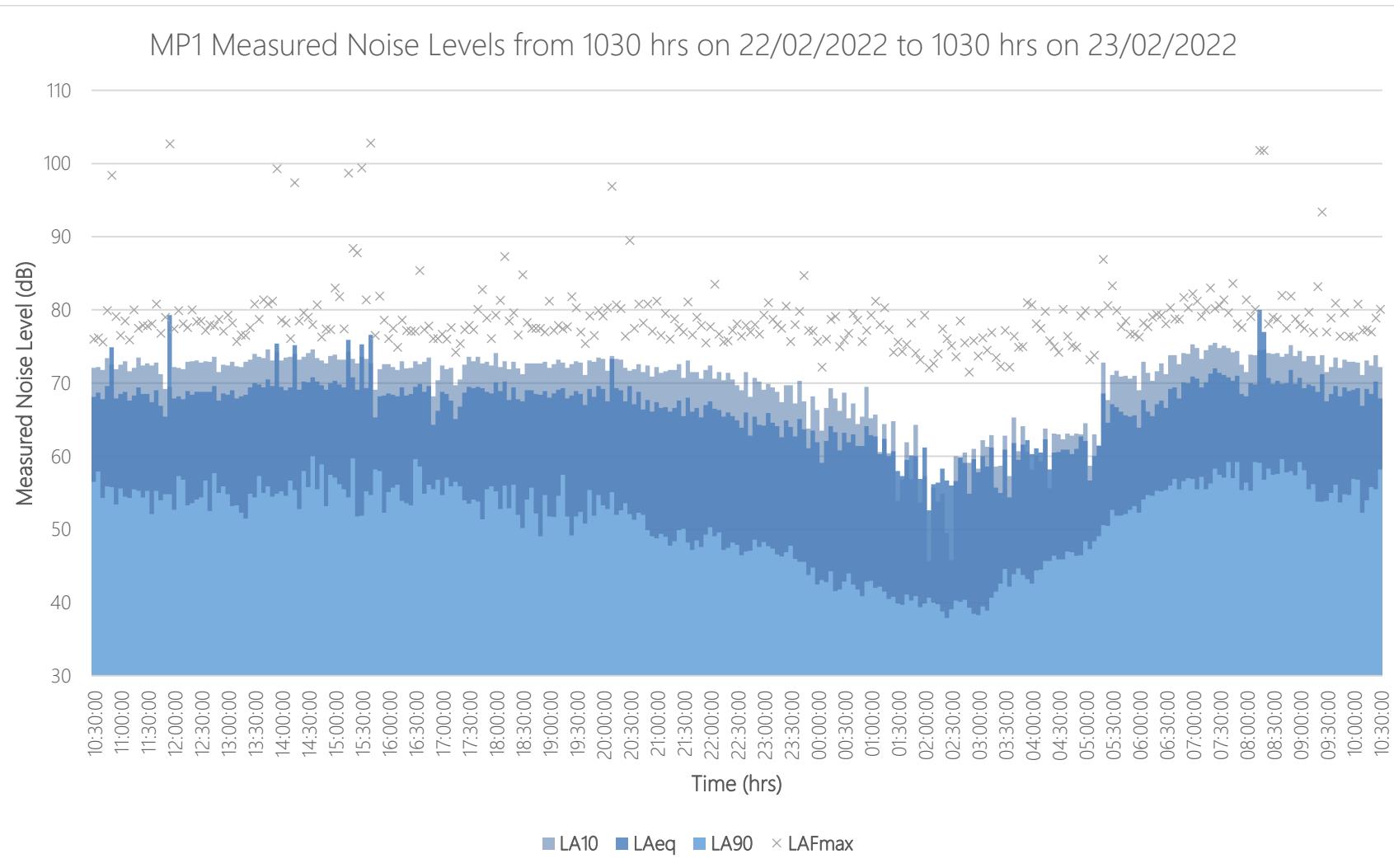
14. Appendix 4: Detailed Noise Measurement Results

Measured Noise levels – MP1

Time	L _{Aeq,T} (dB)	L _{Af(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
10:00-11:00	70	98	72	68
11:00-12:00	71	103	69	67
12:00-13:00	69	80	69	68
13:00-14:00	70	99	70	68
14:00-15:00	71	97	71	69
15:00-16:00	72	103	76	68
16:00-17:00	69	85	70	66
17:00-18:00	69	83	69	67
18:00-19:00	69	87	70	68
19:00-20:00	69	82	69	68
20:00-21:00	69	97	70	66
21:00-22:00	67	81	68	66
22:00-23:00	66	84	66	64
23:00-00:00	64	85	65	63
00:00-01:00	62	80	64	61
01:00-02:00	60	81	63	57
02:00-03:00	58	79	60	55
03:00-04:00	60	81	62	55
04:00-05:00	61	81	62	60
05:00-06:00	65	87	67	60
06:00-07:00	68	82	70	66
07:00-08:00	71	84	71	69
08:00-09:00	73	102	76	70
09:00-10:00	69	93	71	68
07:00-23:00	70	91	71	66
23:00-07:00	63	82	67	57

Measured Noise levels – MP2

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
10:00-11:00	57	79	58	55
11:00-12:00	57	85	61	54
12:00-13:00	60	85	65	55
13:00-14:00	57	80	59	55
14:00-15:00	57	86	59	55
15:00-16:00	57	85	59	55
16:00-17:00	55	76	57	53
17:00-18:00	59	88	63	54
18:00-19:00	54	77	55	53
19:00-20:00	53	70	53	52
20:00-21:00	54	79	57	53
21:00-22:00	52	72	53	51
22:00-23:00	51	68	52	50
23:00-00:00	50	71	51	49
00:00-01:00	48	72	48	46
01:00-02:00	47	72	48	45
02:00-03:00	44	64	45	42
03:00-04:00	46	62	47	45
04:00-05:00	49	66	50	47
05:00-06:00	53	72	55	50
06:00-07:00	59	79	62	55
07:00-08:00	59	80	61	57
08:00-09:00	59	85	62	57
09:00-10:00	58	83	60	55
07:00-23:00	57	81	60	58
23:00-07:00	52	70	55	51



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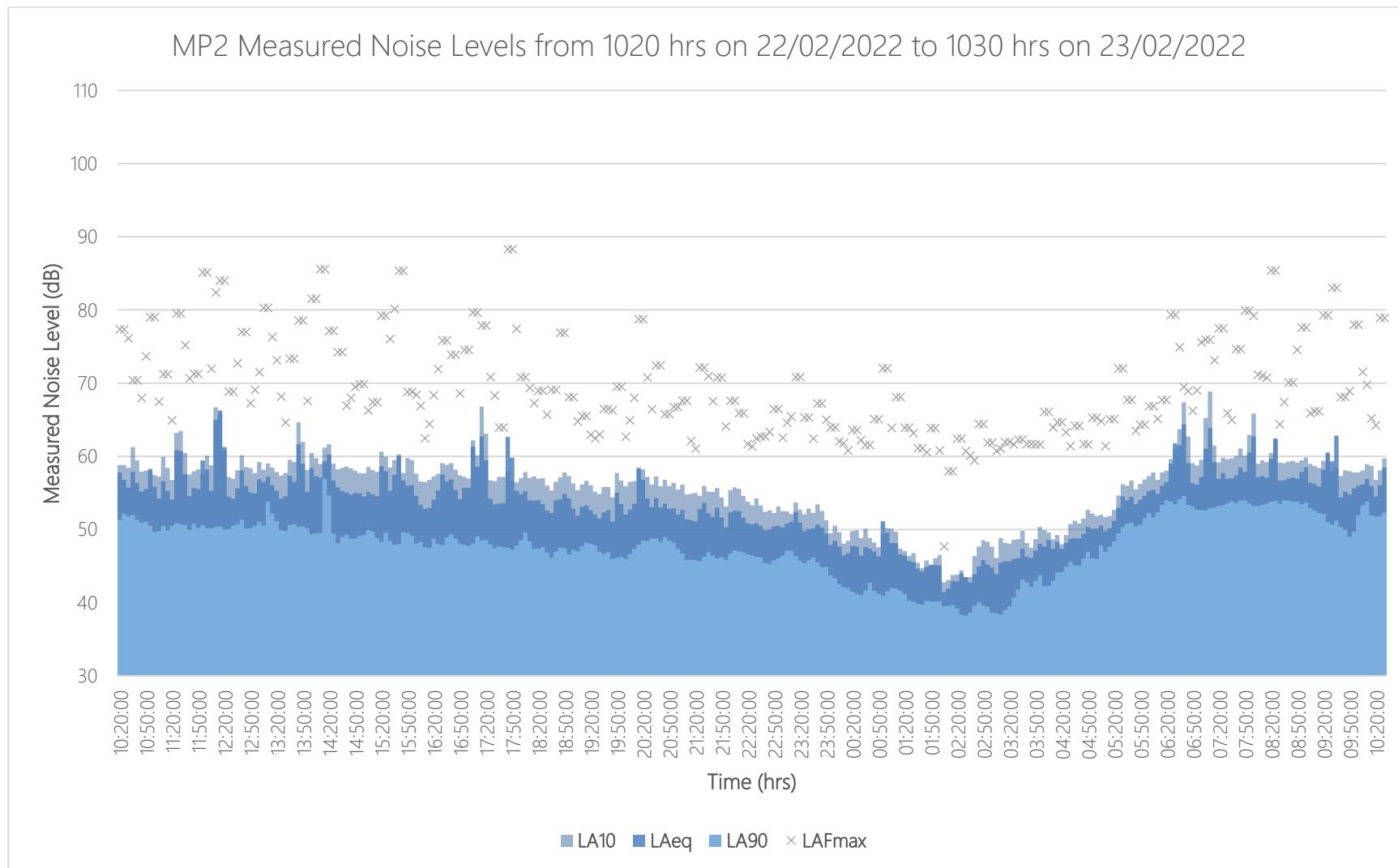
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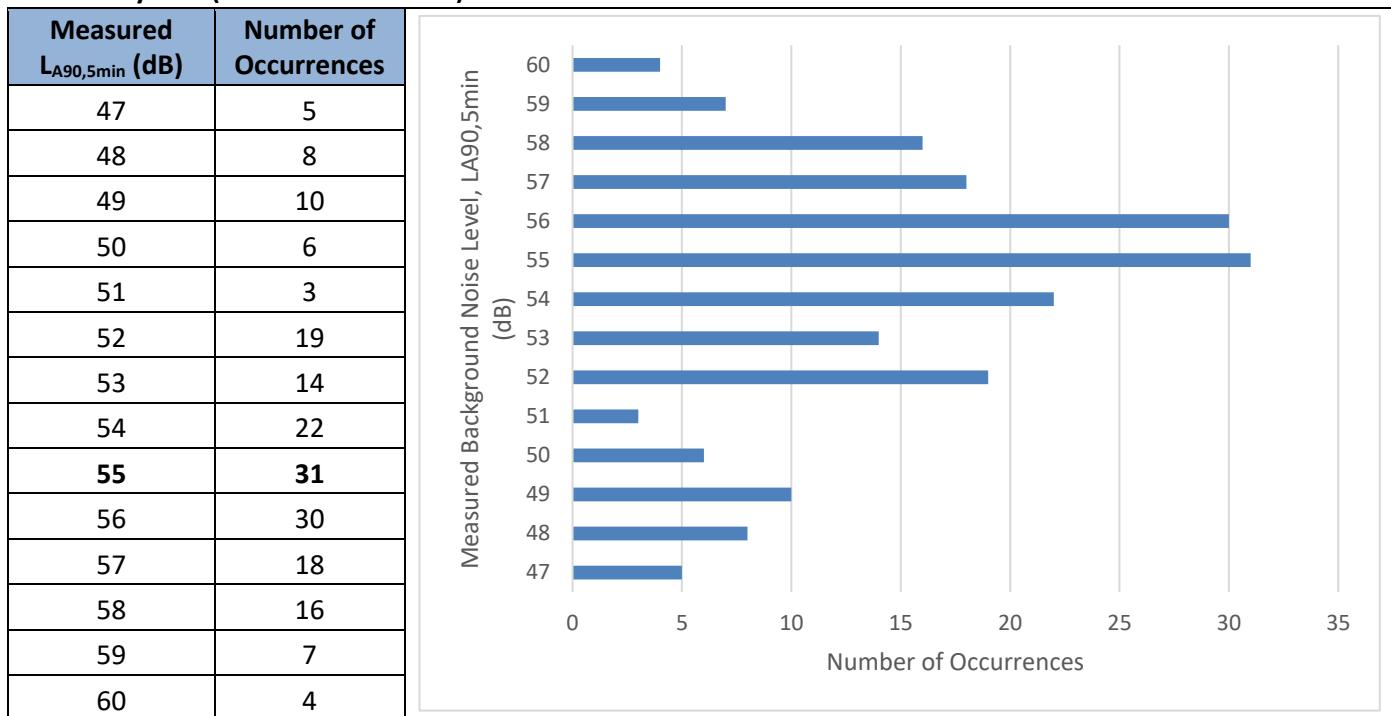


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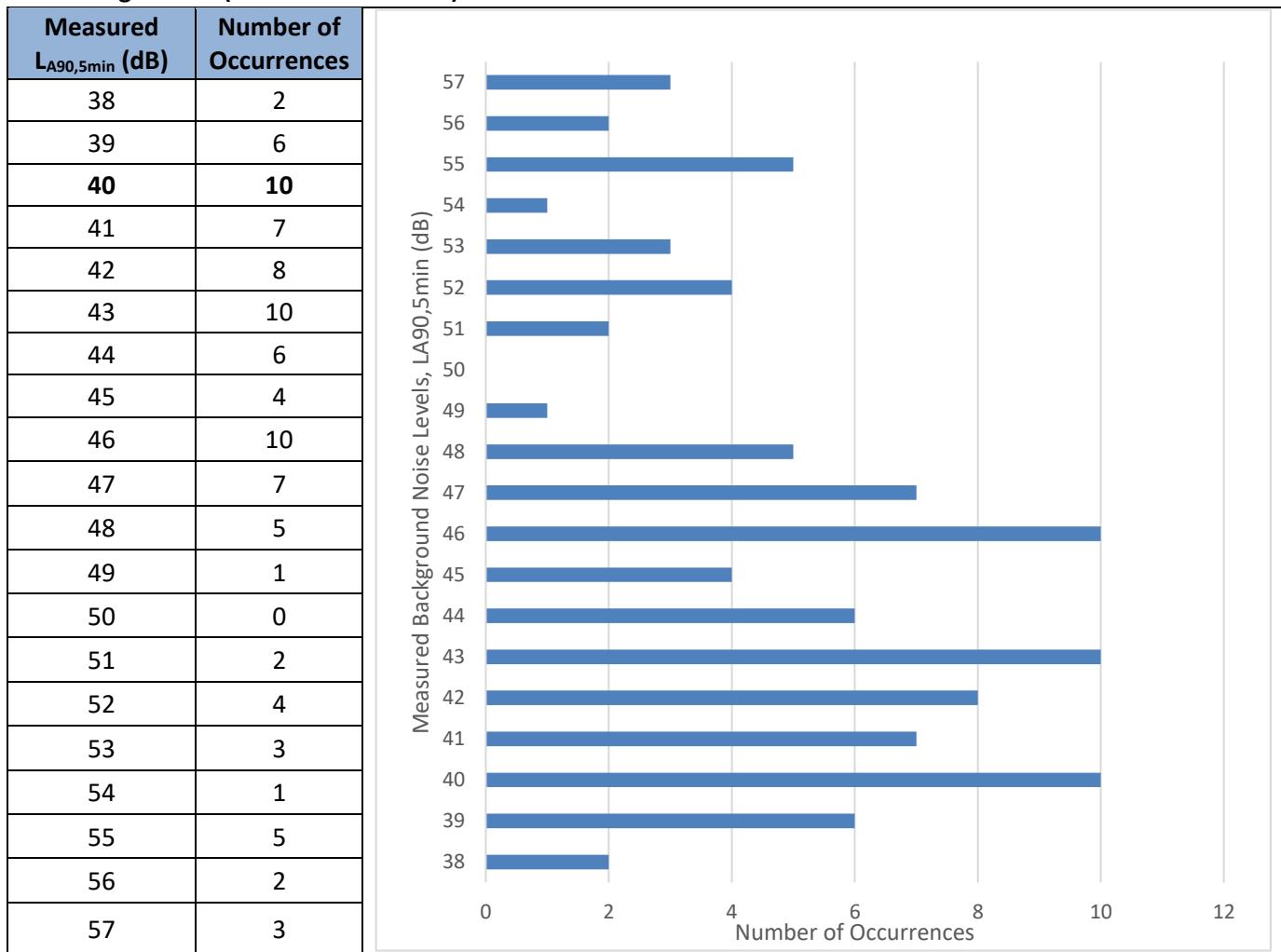
14.1. Typical Background Noise Level Analysis for BS 4142:2014 Assessment

MP1 - Daytime (0700 hrs – 2300 hrs)

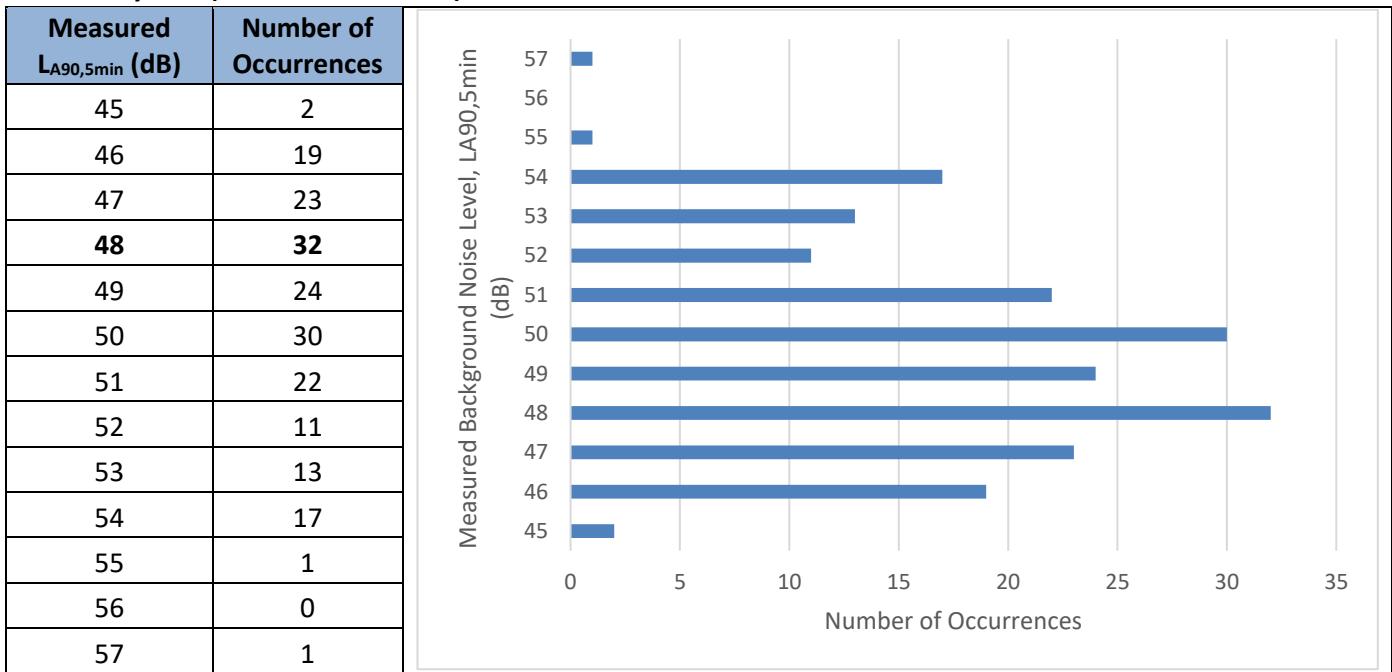


Note: The row marked in bold is the chosen Typical L_{A90} for the BS 4142 plant noise assessment.

MP2 - Night-time (2300 hrs – 0700 hrs)

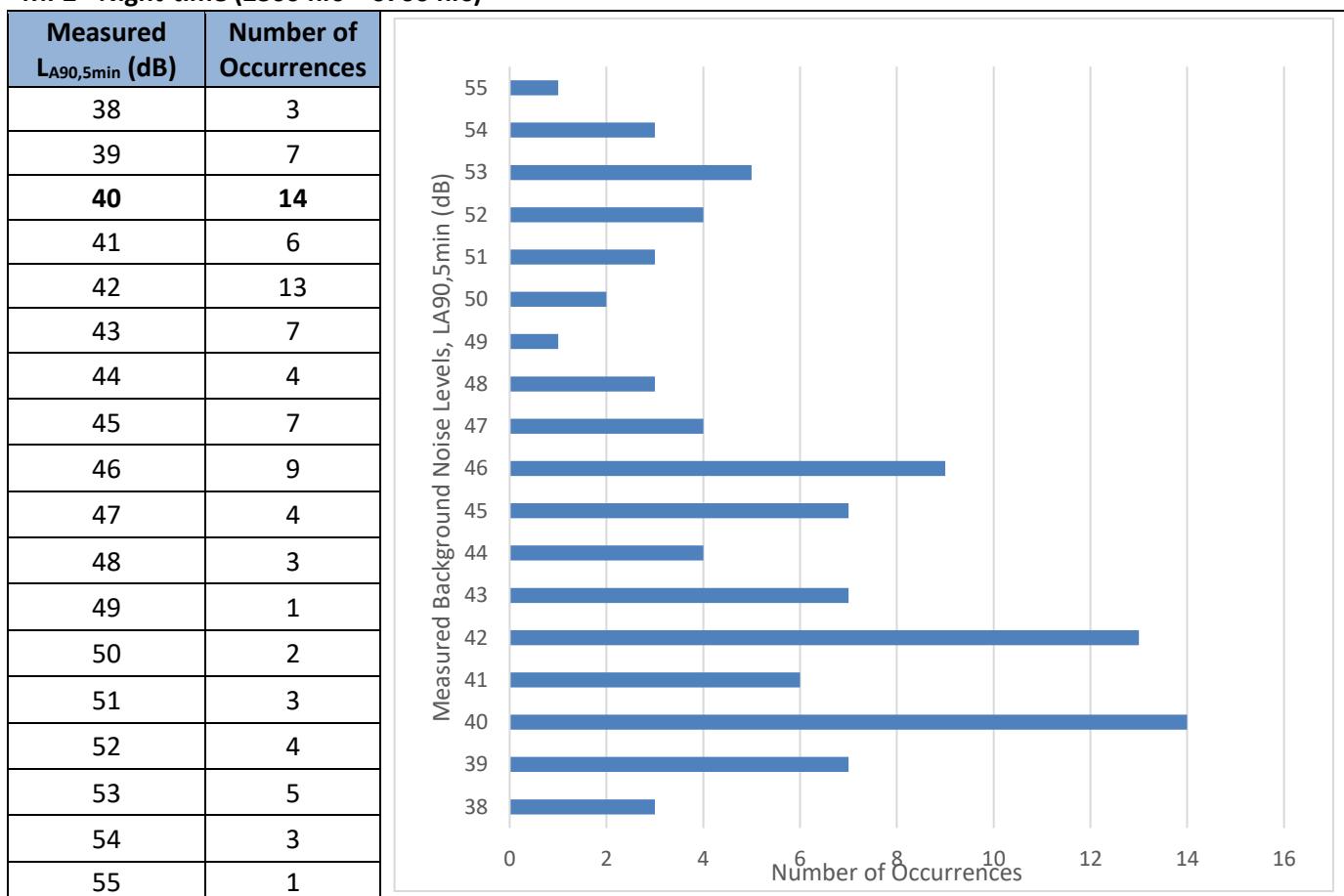


Note: The row marked in bold is the chosen Typical L_{A90} for the BS 4142 plant noise assessment.

MP2 - Daytime (0700 hrs – 2300 hrs)


Note: The row marked in bold is the chosen Typical L_{A90} for the BS 4142 plant noise assessment.

MP2 - Night-time (2300 hrs – 0700 hrs)



Note: The row marked in bold is the chosen Typical L_{A90} for the BS 4142 plant noise assessment.