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Noise Impact Assessment

Spencers Wood Primary School, New School, Land at Church Lane, Hyde End

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Land at Church Lane, Hyde End

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Quality Standards Control

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

A noise assessment has been carried out for the proposed **Spencers Wood Primary School**. The proposed scheme involves a new build primary school incorporating 7 standard classrooms for 210 mainstream intake, 1 classroom to be used a specialist teaching space at the school's discretion, a nursery for circa 30 children, a hall (to minimum DfE standard for 210 pupils), toilets and 1 x hygiene room, limited reception and office space, a staff room / PPE room, kitchen (may be modified to be a servery, rather than a production kitchen), 2 small group rooms and a resource base for 14 ambulant SEND children (ASD / SEMH primary need).

The site is located between Ryeish Lane, Hyde End Lane and Fullbrook Avenue in a residential area. To the north are exiting residential properties and an existing secondary school. To the west and south are existing residential properties around Fullbrook Avenue and to the east is a new residential development currently under construction.

The site is very quiet with distant road traffic noise, natural noises such as bird song and leaves rustling as well as distant aircraft. Occasional noise from the adjacent residential construction site was audible during the site visits.

The results of the noise measurement study have been utilised to identify:

- The requirements for façade sound reduction of the proposed building envelope in order to achieve the requirements of BB93.
 - **The external façade will be designed to achieve a sound reduction of at least 45 dB – 50 dB R_w .**
 - **Minimum glazing acoustic specification 20 dB R_w .**
 - **Open windows should be acceptable for ventilation and mitigation of overheating, or a hybrid acoustic trickle vent/mechanical ventilator system could be used.**
- Maximum noise rating levels for plant associated with the school building in line with the BS 4142:2014 methodologies.
 - A maximum noise level for plant has been provided using an indicative location based on the location of the plant room and kitchen.
 - It is recommended that a further assessment is carried out once precise plant specifications have been determined.
- The impact of noise from activity in the proposed play areas.
 - Noise from the proposed play areas has been shown to be at acceptable levels and advise impacts from noise are not expected.

Achievement of the target noise criteria will ensure compliance with the aims of the NPPF and the PPG in that it will avoid noise from giving rise to significant adverse impacts on health or quality of life for future occupiers of the proposed school and existing occupiers in close proximity to the proposed school.

2. Introduction

This report has been prepared to support the planning application for the proposed **Spencers Wood Primary School, Ryeish Lane, Spencers Wood**. The proposed scheme involves a new build primary school incorporating 7 standard classrooms for 210 mainstream intake, 1 classroom to be used a specialist teaching space at the school's discretion, a nursery for circa 30 children, a hall (to minimum DfE standard for 210 pupils), toilets and 1 x hygiene room, limited reception and office space, a staff room / PPE room, kitchen (may be modified to be a servery, rather than a production kitchen), 2 small group rooms and a resource base for 14 ambulant SEND children (ASD / SEMH primary need).

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

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

The site is located between Ryeish Lane, Hyde End Lane and Fullbrook Avenue in a residential area. To the north are exiting residential properties and an existing secondary school. To the west and south are existing residential properties around Fullbrook Avenue and to the east is a new residential development currently under construction. The location of the proposed development site is provided in **Figure 2.1** and the proposed site layout is provided in **Figure 2.2**.

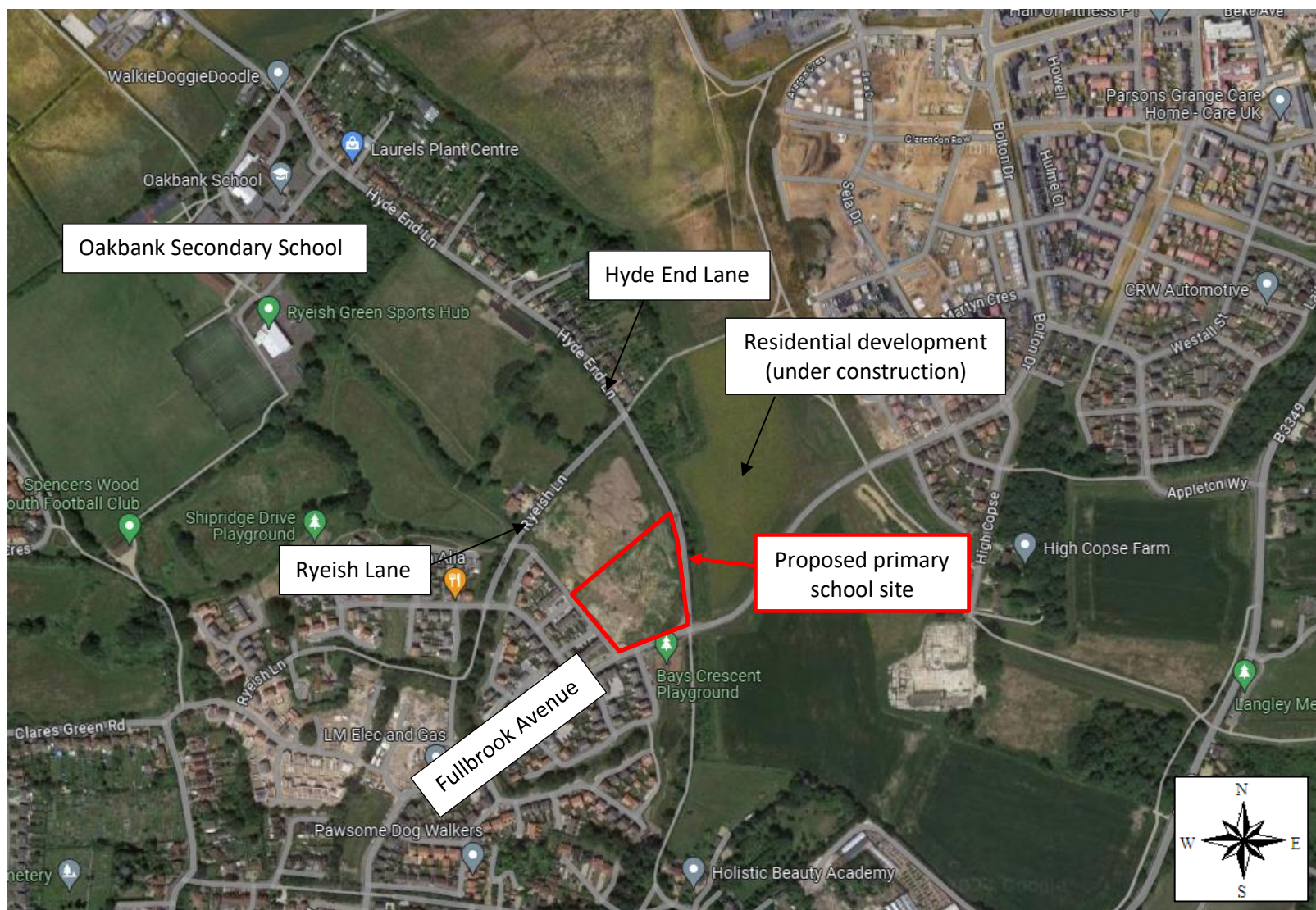


Figure 2.1: Site Location



Figure 2.2: Proposed Site Layout Plan

3. Planning Policy

3.1. National Planning Policy Framework

The National Planning Policy Framework (NPPF) was released in March 2012 and last updated in December 2023. 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'.*

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. Building Bulletin 93 – Acoustic Design of Schools: Performance Standards

Building Bulletin 93 – Acoustic Design of Schools: Performance Standards (BB93) was published in 2014 and sets out minimum performance standards for the acoustics of school buildings and describes the normal means of demonstrating compliance with the Building Regulations. It also provides guidance in support of the School Premises Regulations (2012) and the Independent School Standards (2013). The document supersedes Section 1 of the previous version of BB93 which was published in 2003.

Table 1 in Section 1 of the document specifies an upper limit for indoor ambient noise levels in specified spaces. Those most relevant to primary schools are reproduced in **Table 4.1** below.

Type of Room	Upper limit for the indoor ambient noise level $L_{Aeq,30min}$ (dB)	
	New Build	Refurbishment
Primary school: classroom, class base, general teaching area, small group room	35	40
Open plan: teaching area, resource/breakout area	40	45

Type of Room	Upper limit for the indoor ambient noise level $L_{Aeq,30min}$ (dB)	
	New Build	Refurbishment
Primary music room	35	40
Teaching space intended specifically for students with special hearing and communication needs ⁽¹⁾	30	35
SEN calming room	35	35
Library	40	45
Assembly halls, multi-purpose halls (drama, PE, audio/visual presentations, assembly, occasional music)	35	40
Atrium, circulation space not intended for teaching or learning	45	50
Meeting room, interviewing/counselling room, video conference room	40	45
Dining rooms	45	50
Administration and Ancillary spaces		
Kitchens	50	55
Offices, medical room, staff rooms	40	45
Corridors, stairwells, coats and locker areas	45	50
Changing areas	50	55
Toilets	50	55

Table 4.1: Upper Limit for the Indoor Ambient Noise Level $L_{Aeq,30min}$

Note (1): Alternative performance standards (APS) are commonly required for these rooms and should be agreed by an acoustician and the school client body. See Section 0.4 of BB93.

BB93 also provides guidance on discrete noise events such as aircraft:

‘In order to protect students from regular discrete noise events, e.g. aircraft or trains, indoor ambient noise levels should not exceed 60 dB $L_{A1,30mins}$. This is achieved by default for spaces with internal ambient noise levels up to 40 dB $L_{Aeq,30mins}$ but requires assessment in spaces with higher limits e.g. 45 and 50 dB.’

4.3. Acoustics of Schools – A Design Guide

The document Acoustics of Schools – A Design Guide was published in November 2015 and provides supporting guidance and recommendations on the acoustic design of new and refurbished schools. The document supersedes Sections 2 to 7 of the previous version of BB93 published in 2003 and supports the acoustic performance standards provided in the current version of BB93, published in 2014.

The document provides recommendations which are considered good practice for providing suitable acoustic conditions outside of school buildings. For new schools, 60 dB $L_{Aeq,30min}$ should be regarded as an upper limit for external noise at the boundary of external areas used for formal and informal outdoor teaching and recreation.

The document states that: *‘playgrounds, outdoor recreation areas and playing fields are generally considered to be of relatively low sensitivity to noise, however, where they are used for teaching (e.g. sports lessons) outdoor ambient noise levels have a significant impact on communication in an environment which is already acoustically less favourable than most classrooms. Noise levels in unoccupied playgrounds, playing fields and other outdoor areas should not exceed 55 dB $L_{Aeq,30min}$ and there should be at least one area suitable for outdoor teaching activities where noise levels are below*

50 dB $L_{Aeq,30min}$. Acoustic screening can be used to reduce noise levels in these areas as far as reasonably practicable.'

4.4. Assessment Criteria for Noise from External School Areas

There are no specific noise criteria that particularly relate to the impact of noise from playgrounds and sports pitches on noise sensitive receptors. BS 8233:2014 "Guidance on sound insulation and noise reduction for buildings" and the World Health Organization "Guidelines for Community Noise" both contain relevant noise criteria and set out guideline noise limits that would normally be considered acceptable for a range of noise sources. BS 8233 states that these noise levels relate to "sources without a specific character". Whilst not strictly applicable to noise from playgrounds, which could be described as having a "specific character", the criteria can assist in providing an indication as to the acceptability of noise from this specific source.

Noise predictions can be made of the likely anticipated noise levels arising from the playground activities at the closest residential receptors and these can be compared to guideline noise levels, in order to determine the acceptability of the proposals. Accordingly, the proposed acceptability criteria for this development are outlined in **Table 3.2** below.

	Criterion	Location	Ambient Noise Level $L_{Aeq,T}$
WHO	To prevent annoyance in external amenity areas	Outside dwellings	50
BS 8233	To ensure a reasonable resting condition inside living rooms	Internal	35

Table 9.1: Summary of Noise Criteria: BS 8233 & WHO

It should be noted that the above criteria relate to the daytime period, which is normally defined as 0700 hours to 2300 hours. Additionally, it is important to understand the extent to which noise from the proposed playgrounds would potentially intrude over and above the existing ambient noise levels. Therefore, a comparison of typical playground noise with existing ambient noise levels has also been made.

4.5. 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 four day period. The site was very quiet with distant road traffic noise, natural noises such as bird song and leaves rustling as well as distant aircraft. Occasional noise from the adjacent residential construction site was audible during the site visits.

The noise measurements utilised a Rion NL-52 Type 1 Precision Sound Level Meter 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 checked for calibration 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 0900 hrs on Friday 17th May 2024 and 2320 hrs on Monday 20th May 2024. Further measurements were not possible due to battery failure.

During the noise measurement survey, the temperature was up to 21°C during the daytime, dropping to a low of 8°C overnight. Wind speeds were generally low to moderate (1-3 m/s) from a south-easterly direction at the start of the survey and then changeable before settling on a north-easterly direction towards the end of the survey.

Noise measurements were carried out at Measurement Position 1 (MP1) in a free-field location at a height of 1.5m above ground level on the eastern boundary of the site. Due to the distances to the major noise sources, the position was considered representative of the entire site and surrounding residential receptors as the noise levels are not likely to change significantly across the area.

The noise monitoring position is shown in **Figure 5.1**.



Figure 5.1: Noise Monitoring Location

Table 5.1 below displays a summary of the measured ambient noise levels during likely school activity times and detailed measurement results are presented in **Appendix 4**.

Date	Period (hours)	L _{Aeq,30min} (dB)
Friday 17th May 2024	0900-0930	49
	0930-1000	53
	1000-1030	52
	1030-1100	52
	1100-1130	51
	1130-1200	49
	1200-1230	50
	1230-1300	50
	1300-1330	45
	1330-1400	47
	1400-1430	50
	1430-1500	47
	1500-1530	47
	1530-1600	49
	1600-1630	49
	1630-1700	46
Friday 17th May 2024	0900-1700	50
Monday 20th May 2024	0800-0830	51
	0830-0900	50
	0900-0930	49
	0930-1000	52
	1000-1030	50
	1030-1100	51
	1100-1130	51
	1130-1200	49
	1200-1230	49
	1230-1300	52
	1300-1330	51
	1330-1400	50
	1400-1430	49
	1430-1500	50
	1500-1530	45
	1530-1600	52
	1600-1630	46
	1630-1700	46
Monday 20th May 2024	0800-1700	50

Table 5.1: Summary of Measured Noise Levels

Note: The average noise levels stated are logarithmic for L_{Aeq}.

6. BB93 Noise Level Assessment

6.1. Internal Noise Levels

Table 6.1 below displays the measured external noise levels. Those noise levels are then compared against the requirements of BB93 of the most onerous of the identified internal noise level criteria (classrooms) in order to determine the required sound reduction from the indicated façade, including any windows, to ensure appropriate internal noise levels.

Location	External Noise Levels (dB)	Internal Noise Level Criteria (dB)	Required Sound Reduction (dBA)
	$L_{Aeq,30mins}$	$L_{Aeq,30mins}$	
Proposed classroom	50	35	15

Table 6.1: Façade Noise Level Reduction Requirements

It can be identified, from **Table 6.1**, that 15 dBA noise level reduction is required to achieve appropriate internal noise levels.

Where open windows are utilised to provide ventilation, BB93 allows a reduction of the noise level criterion of 5 dB. Accordingly, this means a reduction 10 dBA is required for acceptable internal noise levels. An open window will provide 10 dBA – 15 dBA attenuation and, accordingly, open windows would therefore be acceptable for ventilation purposes.

The precise requirement will be determined during the detailed design stage with detailed noise break-in calculations. However, as a guide for the planning stage, the following recommendations are made by Jomas to ensure appropriate internal noise levels:

- **The external façade will be designed to achieve a sound reduction of at least 45 dB – 50 dB R_w .**
- **Minimum glazing acoustic specification 20 dB R_w .**
- **Open windows should be acceptable for ventilation and mitigation of overheating, or a hybrid acoustic trickle vent/mechanical ventilator system could be used.**

6.2. External Noise Levels

The results of the noise measurement survey indicate that the external areas, including outdoor teaching areas should achieve the 50 dB $L_{Aeq,30min}$ criterion recommended in the 'Acoustics of Schools – A Design Guide' document without the need for further mitigation measures.

7. Plant Noise Assessment – Maximum Sound Power Level

The precise details of the proposed plant types are not yet available; therefore, the maximum sound power level has been derived utilising the background noise level from the survey presented in **Section 5** and the basic methodologies presented in BS 4142:2014. An analysis of background noise levels is provided in **Appendix 4**. The derivation of a maximum plant noise level is summarised in **Table 8.1**. The aim is to avoid significant impacts, in line with the requirements of BS4142:2014. This means generally means being equal to or below 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)	36	30	8.1, 8.2	Refer to Appendix 4
Required Difference between Rating Level and Background Sound Level	+0	+0	9.2	Identified requirement: Equal to the background noise level
Rating Level	36	30	9.2	(Specific Sound Level + Acoustic Feature Correction)
Acoustic Feature Correction	<i>Unknown</i>	<i>Unknown</i>	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	36	30	7.3.7, 7.3.9, 7.3.11	Derived from the typical background sound level
Maximum Sound Power Level	74	68		Indicative only. Assumes receptor at 30m from plant, based on identified location of plant room and kitchen area on the layout plans.

Table 8.1: Total Sound Level of Plant Equipment

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 **Table 8.1**. It is noted that the maximum noise levels stated are the total plant noise levels, and not the noise levels from each individual item of plant. 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.

8. External Activity Noise Levels

The proposed plans for the school include play areas outside each classroom as well as a proposed MUGA in the north-east corner of the site.

In order to determine whether the predicted noise levels emanating from the play areas are within reasonable limits, it is necessary to predict the future noise levels when the play areas are in use.

8.1. Playground Noise Measurements

In order to provide the necessary source noise data to calculate the likely levels of noise from the use of the playground areas, Syntegra have used the results of a previous noise measurement survey at an existing primary school.

The acoustic characteristics of a primary school playground invariably involves small groups of children of various ages talking with occasional raised voices and occasional playful screams. In the years 3 and 4 playground area, some organised activities took place including games with bats and balls, space hoppers and climbing frames. During the noise measurements, the numbers of children in the play areas ranged from 30-40 up to around 130.

The measurements were taken as one second L_{Aeq} noise levels and a summary of the measured noise levels is provided in **Table 8.1** below.

Measurement Location	Approximate Number of Pupils	Measurement	Noise Level Arising from the Playground $L_{Aeq,1sec}$ (dB)
Years 1-2 – Middle of playground	130	Average	77
		Highest	92
Years 1-2 – Edge of playground	130	Average	76
		Highest	93
Years 3-4 – Middle of playground	100	Average	78
		Highest	93
Years 3-4 – Edge of playground	30-40	Average	75
		Highest	84

Table 8.1: Noise Levels from Primary School Playgrounds

It can be seen, by reference to **Table 8.1**, that there is not a wide range of average noise levels regardless of the age or number of children in the play area. It is appropriate for an impact assessment to consider the average and highest noise levels in order to demonstrate the range of noise impacts at the identified noise sensitive receptors. In the noise model discussed below the highest measured $L_{Aeq,1sec}$ (93 dB) has been utilised to represent the L_{Amax} noise level and the highest average $L_{Aeq,1sec}$ (78 dB) has been utilised to represent the average L_{Aeq} noise level as a worst case.

8.2. Predicted Noise Levels

The noise levels from the playgrounds at the nearest noise sensitive receptors have been predicted utilising standard acoustic formulae. An indicative distance of 40m has been taken based on the location of the nearest play area on the site layout plans. The receptor location noise predictions are summarised in **Table 8.2** below.

Receptor	Noise Level arising from the playgrounds	
	Average (L_{Aeq})	Highest (L_{Amax})
Nearest Receptors on Fullbrook Avenue/Shipridge Drive	46	61

Table 8.2: Predicted Noise Level from the playgrounds

8.3. Activity Noise Impact Assessment

In order to determine the noise impact and the acceptability of the use of the playgrounds, a comparison has been carried out against the noise criteria identified in **Section 4.4**. **Table 8.3** identifies the assessment carried out to determine compliance with BS 8233 and World Health Organization Guidelines for the average noise levels and **Table 8.4** identifies the highest noise levels.

Receptor	Predicted External Noise Level L_{Aeq} (dB)	Existing Ambient Noise Level L_{Aeq} (dB)	Difference to External Noise Level (dB)	Predicted Internal Noise Level ⁽¹⁾ L_{Aeq} (dB)	Compliance with Criteria ⁽²⁾	
					WHO Guidelines (55 dB L_{Aeq} external)	BS 8233 (35 dB L_{Aeq} internal)
Nearest Receptors on Fullbrook Avenue/Shipridge Drive	46	50	-4	31	✓	✓

Table 8.3: Noise Impact Assessment of the Playgrounds – Average Noise Levels

Notes: (1) Where internal noise levels are concerned we have assumed a reduction of 15 dB(A) with windows open. The assessment considers the predicted noise from the playground only, and not the existing ambient noise level.
(2) The assessment against the WHO and BS8233 noise criteria considers the predicted noise from the playground only, and not the existing ambient noise level.

Receptor	Predicted External Noise Level L_{Amax} (dB)
Nearest Receptors on Fullbrook Avenue/Shipridge Drive	61

Table 8.4: Noise Impact Assessment of the Playgrounds – Highest Noise Levels

It can be seen, by reference to **Table 8.3**, that predicted activity noise levels at the identified noise sensitive receptors, from the closest playground position, will be below the existing ambient noise levels. It is also identified that the predicted noise levels will be below the identified external and internal noise level criteria. In terms of maximum noise levels, there are no daytime criteria relevant for this type of noise source impacting on existing residential properties. Occasional instances of the identified L_{Amax} noise level, externally and during the daytime, is not considered to be excessively loud and should therefore be acceptable.

It should be noted that the noise criteria provided within the WHO guidelines and BS 8233 are for average noise levels over a 16-hour day and the activity noise levels that have been utilised for the assessment will only occur during break and lunch times (for between one and two hours a day). The activity noise levels will therefore only occur for part of the day and will not affect the identified noise sensitive receptors continuously. It should also be noted that the activity noise will occur in the mid-morning and afternoon, and not during the early morning or evening time periods which is when residents are generally more sensitive to noise. Therefore, activity noise levels from the external play areas are not considered to result in any adverse noise impacts for existing noise sensitive receptors.

9. Conclusion

A noise assessment has been carried out for the proposed **Spencers Wood Primary School**. The proposed scheme involves a new build primary school incorporating 7 standard classrooms for 210 mainstream intake, 1 classroom to be used a specialist teaching space at the school's discretion, a nursery for circa 30 children, a hall (to minimum DfE standard for 210 pupils), toilets and 1 x hygiene room, limited reception and office space, a staff room / PPE room, kitchen (may be modified to be a servery, rather than a production kitchen), 2 small group rooms and a resource base for 14 ambulant SEND children (ASD / SEMH primary need).

The site is very quiet with distant road traffic noise, natural noises such as bird song and leaves rustling as well as distant aircraft. Occasional noise from the adjacent residential construction site was audible during the site visits.

The results of the noise measurement study have been utilised to identify:

- The requirements for façade sound reduction of the proposed building envelope in order to achieve the requirements of BB93.
 - **The external façade will be designed to achieve a sound reduction of at least 45 dB – 50 dB R_w .**
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 - A maximum noise level for plant has been provided using an indicative location based on the location of the plant room and kitchen.
 - It is recommended that a further assessment is carried out once precise plant specifications have been determined.
- The impact of noise from activity in the proposed play areas.
 - Noise from the proposed play areas has been shown to be at acceptable levels and advise impacts from noise are not expected.

Achievement of the target noise criteria will ensure compliance with the aims of the NPPF and the PPG in that it will avoid noise from giving rise to significant adverse impacts on health or quality of life for future occupiers of the proposed school and existing occupiers in close proximity to the proposed school.

10. 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>

11. Appendix 2: Professional Statement

David Yates

David Yates is a full member of the Institute of Acoustics (MIOA) and has 15 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.

12. Appendix 3: List of Equipment

Equipment Type	Manufacturer	Serial Number	Calibration Certification Number	Date of Last Calibration Check
NL-52 Type 1 Sound Level Meter	Rion	00586904	UCRT23/1873	July 2023
UC-59 Microphone	Rion	13361	UCRT23/1873	July 2023
NH-25 Preamplifier	Rion	87023	UCRT23/1873	July 2023
NC-75 Sound Calibrator	Rion	34334835	UCRT23/1873	July 2023

13. Appendix 4: Detailed Noise Measurement Results

Measured Noise levels – MP1 – 17/05/2024

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
0900-1000	51	74	54	48
1000-1100	52	69	53	49
1100-1200	50	70	52	46
1200-1300	50	71	54	47
1300-1400	46	65	48	42
1400-1500	49	71	51	45
1500-1600	48	69	49	43
1600-1700	48	66	51	45
1700-1800	48	65	50	45
1800-1900	46	64	48	43
1900-2000	51	67	53	46
2000-2100	46	65	48	39
2100-2200	42	61	44	40
2200-2300	41	69	43	40
2300-0000	39	60	41	37
0700-2300	49	68	50	44
2300-0700	39	60	41	37

Measured Noise levels – MP1 – 18/05/2024

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
0000-0100	38	56	39	36
0100-0200	40	59	41	39
0200-0300	41	59	42	40
0300-0400	53	67	56	43
0400-0500	54	69	55	50
0500-0600	53	69	56	49
0600-0700	52	74	54	49
0700-0800	51	67	52	47
0800-0900	51	68	53	47
0900-1000	49	66	50	48
1000-1100	50	79	52	47
1100-1200	51	75	53	48
1200-1300	48	68	50	46
1300-1400	50	72	52	42
1400-1500	45	61	46	42
1500-1600	46	69	47	44
1600-1700	47	65	50	44
1700-1800	48	74	50	44
1800-1900	47	71	50	43
1900-2000	50	65	52	47
2000-2100	48	67	53	37
2100-2200	40	65	42	38
2200-2300	39	63	41	36
2300-0000	38	60	39	35
0700-2300	48	68	50	44
2300-0700	50	64	48	43

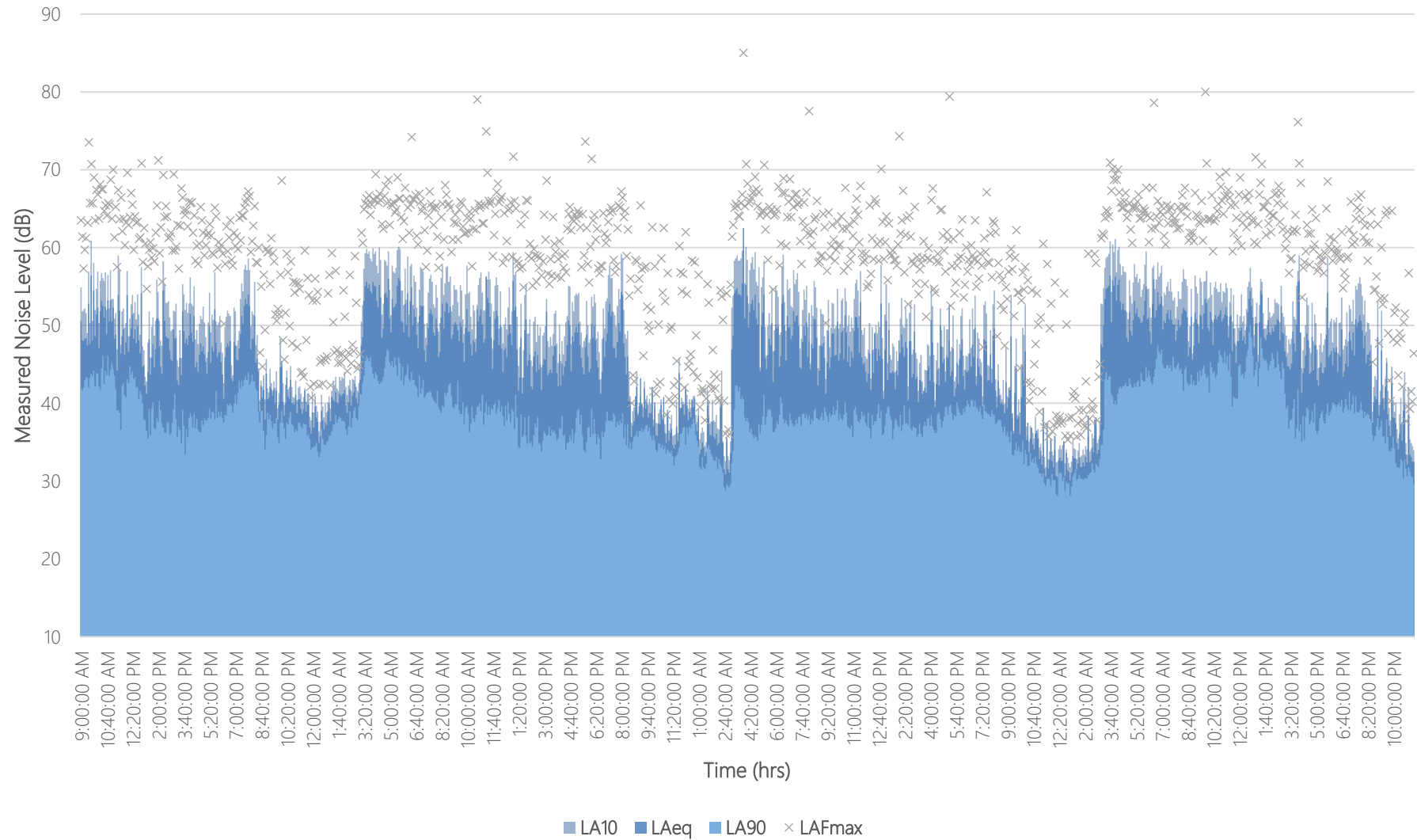
Measured Noise levels – MP1 – 19/05/2024

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
0000-0100	39	62	41	37
0100-0200	36	57	38	34
0200-0300	36	55	39	32
0300-0400	55	85	55	35
0400-0500	53	71	54	50
0500-0600	49	71	51	44
0600-0700	50	69	53	46
0700-0800	49	67	51	45
0800-0900	48	78	51	44
0900-1000	47	65	49	45
1000-1100	48	68	50	45
1100-1200	49	68	51	44
1200-1300	47	70	49	44
1300-1400	46	64	49	42
1400-1500	47	74	48	43
1500-1600	44	65	45	41
1600-1700	46	68	50	42
1700-1800	46	79	47	42
1800-1900	46	64	48	44
1900-2000	45	67	48	42
2000-2100	44	63	48	39
2100-2200	42	62	44	36
2200-2300	40	58	45	34
2300-0000	35	61	37	32
0700-2300	47	67	48	42
2300-0700	49	66	46	39

Measured Noise levels – MP1 – 20/05/2024

Time	L _{Aeq,T} (dB)	L _{AF(max)} (dB)	L _{A10} (dB)	L _{A90} (dB)
0000-0100	33	56	35	31
0100-0200	32	42	33	31
0200-0300	35	59	38	32
0300-0400	53	71	56	47
0400-0500	53	70	56	49
0500-0600	51	67	53	49
0600-0700	53	79	55	49
0700-0800	51	65	52	50
0800-0900	51	68	52	47
0900-1000	51	80	53	47
1000-1100	51	69	52	49
1100-1200	50	70	51	47
1200-1300	51	69	53	48
1300-1400	51	72	54	47
1400-1500	50	68	51	49
1500-1600	50	76	55	45
1600-1700	46	68	49	44
1700-1800	47	69	49	43
1800-1900	46	62	47	44
1900-2000	49	67	51	46
2000-2100	46	65	49	40
2100-2200	43	65	47	37
2200-2300	37	52	39	33
2300-0000	35	57	36	33
0700-2300	49	68	50	45
2300-0700	50	62	45	40

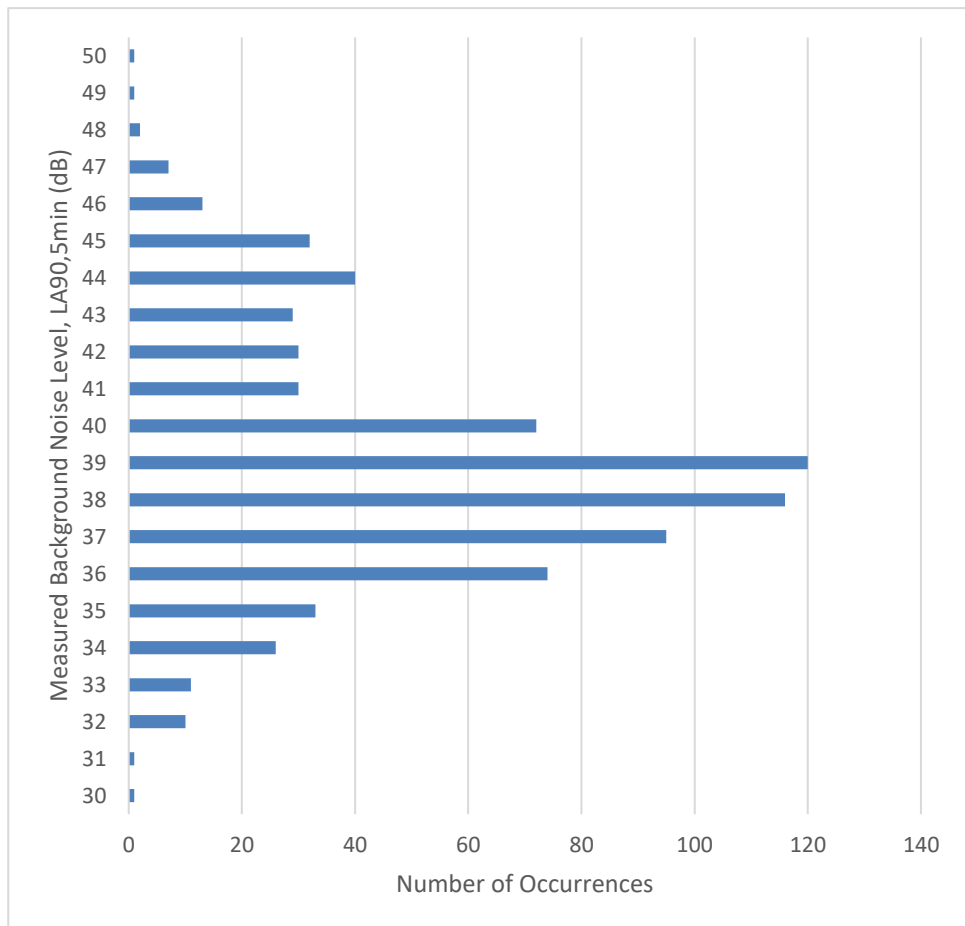
MP1 Measured Noise Levels from 0900 hrs on 17/05/2024 to 2320 hrs on 20/05/2024



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

MP1 - Daytime (0700 hrs – 2300 hrs)

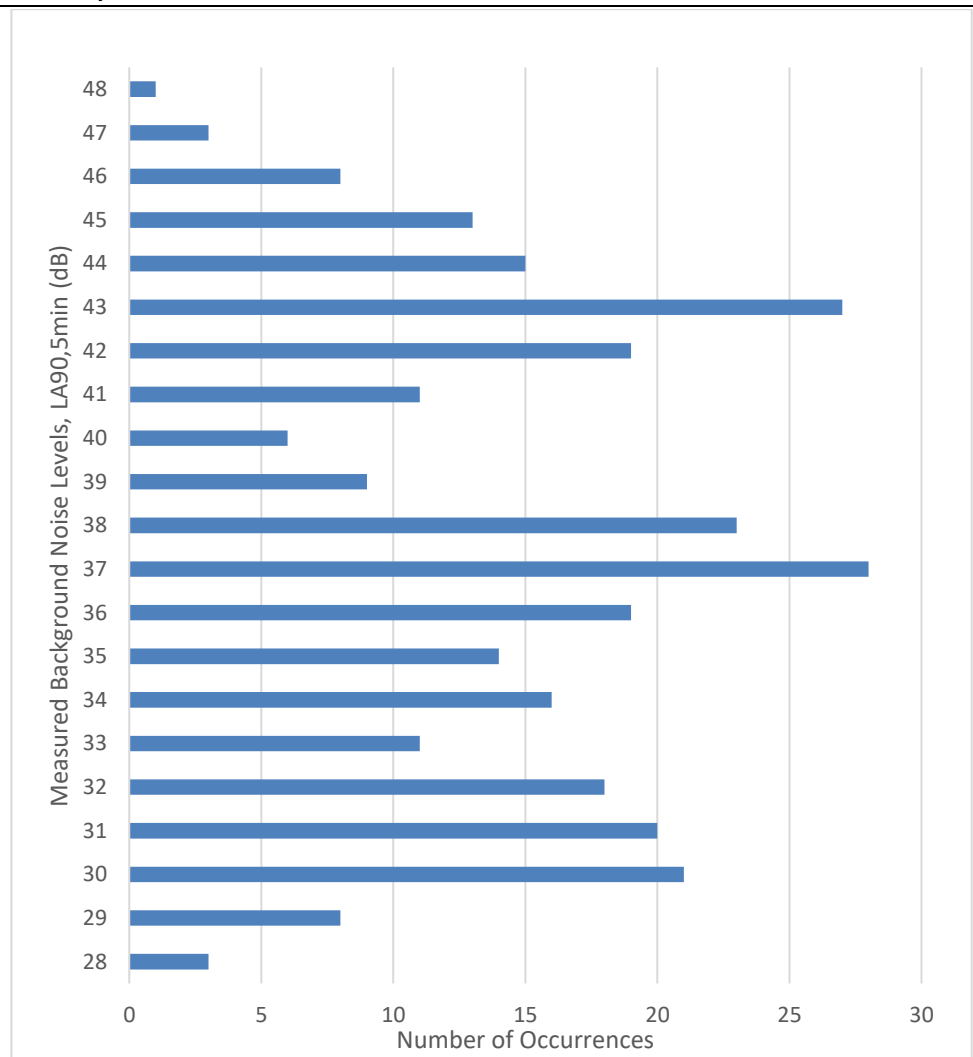
Measured L _{A90,5min} (dB)	Number of Occurrences
30	1
31	1
32	10
33	11
34	26
35	33
36	74
37	95
38	116
39	120
40	72
41	30
42	30
43	29
44	40
45	32
46	13
47	7
48	2
49	1
50	1



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

MP1 - Night-time (2300 hrs – 0700 hrs)

Measured L _{A90,5min} (dB)	Number of Occurrences
28	3
29	8
30	21
31	20
32	18
33	11
34	16
35	14
36	19
37	28
38	23
39	9
40	6
41	11
42	19
43	27
44	15
45	13
46	8
47	3
48	1



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

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