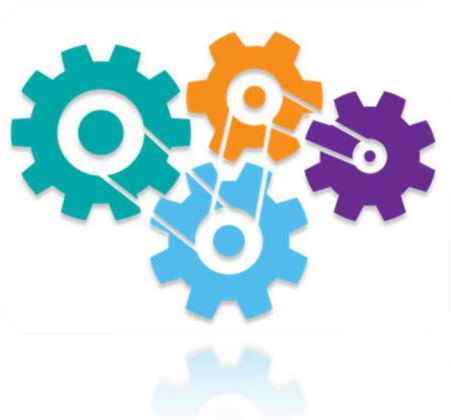
SYNTEGRA CONSULTING

Aviation House,
Harmondsworth Lane,
Harmondsworth,
West Drayton
UB7 0LQ

Noise Impact Assessment for a School

October 2023



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Revision	-
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1. Executive Summary

A noise assessment has been carried out for the proposed school at **Aviation House, Harmondsworth Lane, Harmondsworth, West Drayton UB7 0LQ**. The proposed scheme involves the conversion of an existing office building to provide a building with SEND education facilities for up to 40 pupils of primary school age (age 4-11).

The site is located on the edge of a mixed commercial and residential area in Harmondsworth. The north runway of Heathrow Airport is located approximately 1200m south of Aviation House, the M25 is located approximately 1500m west of Aviation House and the M4 approximately 640m north of Aviation House. The nearest noise sensitive receptors are located at 22-24 Holloway Lane (approximately 75m to the north) and 1-8 Wilton Close (approximately 140m west).

The noise climate is dominated by very frequent aircraft noise and distant road traffic noise. Additionally, there are occasional local car movements in the existing car park to the north and intermittent plant noise was audible, but not loud.

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 existing external façade should achieve a sound reduction of at least 45 dB – 50 dB R_w.**
    - **Minimum glazing acoustic specification 24 dB R_w, ideally the glazing specification will be at least 29 dB R_w, which is easily achievable with standard double-glazing systems, to achieve the "new build" noise levels for SEN classrooms to assist with speech intelligibility for the hearing impaired.**
    - **An alternative means of ventilation for background ventilation and mitigation of overheating should be installed to prevent the need to open windows for those purposes.**
- External noise levels in playgrounds are below the upper limit of acceptability so should not be a reason for refusal, however fails to achieve the ideal noise level criteria. **It is becoming increasingly common in this area around Heathrow Airport to provide sheltered areas, such as pods, in the playground area to provide a respite area from aircraft noise.**
- Maximum noise rating levels for plant associated with the school building in line with the BS 4142:2014 methodologies. It is recommended that a further, detailed plant noise, assessment is carried out once precise plant specifications have been determined.
- The impact of noise from activity in the proposed play areas. It has been concluded that activity noise levels from the external play areas are not likely to result in any significant noise impacts for existing noise sensitive receptors. Noise from the use of the playgrounds is unlikely to be noticeable at the nearest noise sensitive receptors.

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 assess the noise constraints and impacts for the proposed school at **Aviation House, Harmondsworth Lane, Harmondsworth, West Drayton UB7 0LQ**. The proposed scheme involves the conversion of an existing office building to provide a building with SEND education facilities for up to 40 pupils of primary school age (age 4-11).

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

The site is located on the edge of a mixed commercial and residential area in Harmondsworth. The north runway of Heathrow Airport is located approximately 1200m south of Aviation House, the M25 is located approximately 1500m west of Aviation House and the M4 approximately 640m north of Aviation House. The nearest noise sensitive receptors are located at 22-24 Holloway Lane (approximately 75m to the north) and 1-8 Wilton Close (approximately 140m west).

The location of the proposed development site and nearest noise sensitive receptors is provided in **Figure 2.1**.

Figure 2.1: Site Location

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 the London Borough of Hillingdon (LBH).

Syntegra have been unable to find any specific policies relating to noise and schools within LBH's Local Plan documents, however the following noise related policies are relevant.

London Borough of Hillingdon Local Plan Part 1 Strategic Policies (adopted November 2012).

"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.

…"

London Borough of Hillingdon Local Plan Part 2 Development Management Policies (adopted January 2020).

"Policy DMAV 1: Safe Operation of Airports

A) The Council will support the continued safe operation of Heathrow Airport and RAF Northolt and will consult with the airport operator on proposals in the safeguarded areas. Proposals that may be a hazard to aircraft safety will not be permitted.

B) In consultation with the Airport Operator, the Council will ensure that:

> *i) areas included in Airport Public Safety zones are protected from development which may lead to an increase in people residing, working or congregating in these zones; and*
> *ii) sensitive uses such as housing, education and hospitals are not located in areas significantly affected by aircraft noise without acceptable mitigation measures."*

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
Teaching space intended specifically for students with special hearing and communication needs	30	35
SEN calming room	35	35
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
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 $L_{Aeq,30min}$

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. 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.*

4.5. 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 4.2** 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 4.1: 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.**

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 5 day period. The noise climate was dominated by very frequent aircraft noise and distant road traffic noise. Additionally, there were occasional local car movements in the existing car park to the north and intermittent plant noise was audible, but not loud.

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 2**. 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).

Measurements were carried out between 1245 hrs on Thursday 21st September 2023 to 1120 hrs on Monday 25th September 2023.

During the noise measurement survey the temperature was up to 20°C during the daytime, dropping to a low of 8°C overnight. Wind speeds were generally low to moderate (1-3 m/s) and from a westerly or south-westerly direction. Cloud cover was noted to be 80% at set up and 20% on collection.

Noise measurements were carried out at Measurement Position 1 (MP1) in a free-field location close to the south-east corner of Aviation House. The measurement location was chosen in order to measure from a representative position in a reasonably secure location. As the dominant noise sources at site were distant road traffic noise from the nearby motorways and aircraft noise, with relatively quiet roads surrounding the site, noise levels would not be expected to be significantly different across the site and at nearby noise sensitive receptors.

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 3**.

Measurement Position	Period (hours)	$L_{Aeq,T}$ (dB)	L_{A01} (dB)	L_{A90} (dB)
MP1	Daytime (0700 hrs – 2300 hrs)	59	62	44
	Night-time (2300 hrs – 0700 hrs)	51	53	39

Table 5.1: Summary of Measured Noise Levels

Note: The average noise levels stated are logarithmic for L_{Aeq}, arithmetic for L_{A01} and the L_{A90} is the most commonly measured $L_{A90,5min}$ across the assessment period.

6. BB93 Noise Level Assessment

6.1. Internal Noise Levels

The proposed classrooms will be located at 1st and 2nd floor level. MP1 is considered representative of the noise levels external to all rooms.

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	59	35	24

Table 6.1: Façade Noise Level Reduction Requirements

It can be identified, from **Table 6.1**, that 24 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 19 dBA is required for acceptable internal noise levels. An open window will provide 10 dBA – 15 dBA attenuation and, accordingly, open windows would not 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 Syntegra to ensure appropriate internal noise levels:

- **The existing external façade should achieve a sound reduction of at least 45 dB – 50 dB R_w.**
- **Minimum glazing acoustic specification 24 dB R_w, ideally the glazing specification will be at least 29 dB R_w, which is easily achievable with standard double-glazing systems, to achieve the "new build" noise levels for SEN classrooms to assist with speech intelligibility for the hearing impaired.**
- **An alternative means of ventilation for background ventilation and mitigation of overheating should be installed to prevent the need to open windows for those purposes.**

6.2. External Noise Levels

The results of the noise measurement survey indicate that the external areas, including outdoor teaching areas would be approximately 59 dB $L_{Aeq,30min}$. This is below the upper limit of acceptability so should not be a reason for refusal, however this fails to achieve the noise level criteria recommended in the 'Acoustics of Schools – A Design Guide' document. The major source of noise driving the higher noise levels is from aircraft which is difficult to mitigate against. It is becoming increasingly common in this area around Heathrow Airport to provide sheltered areas, such as pods, in the playground area to provide a respite area from aircraft noise.

7. Plant Noise Assessment

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 presented in **Section 5** and the basic methodologies presented in BS 4142:2014. This derivation is summarised in **Table 7.1**. The aim is to meet the requirements of the Local Authority which is understood to be equal to be 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)	44	39	8.1, 8.2	Refer to **Table 5.1**.
Required Difference between Rating Level and Background Sound Level	0	0	9.2	LA requirement: Equal to the background noise level
Rating Level	44	39	9.2	(Specific Sound Level + Acoustic Feature Correction)
Acoustic Feature Correction	*None*	*None*	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	**44**	**39**	7.3.7, 7.3.9, 7.3.11	Derived from the typical background sound level
Maximum Sound Power Level	**90**	**85**		Indicative only. Assumes receptor at 75m from plant.

Table 7.1: 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 7.1**. 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 two external play areas as shown in **Figure 8.1** below.

Figure 8.1: Proposed Site Plan

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. The nearest noise sensitive receptors are located at 22-24 Holloway Lane (approximately 75m to the north) and 1-8 Wilton Close (approximately 140m west). The receptor locations are detailed in **Figure 2.1**.

The receptor location noise predictions are summarised in **Table 8.2** below. The predictions have considered only distance and not any walls or boundary treatments between the playgrounds and nearest noise sensitive receptors.

Receptor	Noise Level arising from the playgrounds	
	Average (L_{Aeq})	Highest (L_{Amax})
22-24 Holloway Lane	40	55
1-8 Wilton Close	35	50

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)	Change in External Noise Level (dB)	Predicted Internal Noise Level[(1)] L_{Aeq} (dB)	Compliance with Criteria[(2)]	
					WHO Guidelines (50 dB L_{Aeq} external)	BS 8233 (35 dB L_{Aeq} internal)
22-24 Holloway Lane	40	59	0	25	✓	✓
1-8 Wilton Close	35	59	0	10	✓	✓

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)
22-24 Holloway Lane	55
1-8 Wilton Close	50

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

It can be seen, by reference to **Table 8.3**, that noise from playground activities are likely to be significantly below the existing ambient noise levels at the identified noise sensitive receptors. It has also been identified that activity noise levels are significantly below the WHO Guidelines and BS 8233 criteria. Whilst the identified criteria are not necessarily appropriate for such activity noise, being significantly lower than those levels provides a good indication that noise levels are likely to be acceptable.

Table 8.4 identifies the likely L_{AMax} noise levels at the receptors. Whilst there is no criteria during the daytime to compare L_{AMax} noise levels against, the absolute levels are not high and are below the existing ambient (L_{Aeq}) noise levels. Accordingly, L_{AMax} noise levels are likely to be acceptable.

It should be noted that 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. Accordingly, it can be safely concluded that activity noise levels from the external play areas are not considered to result in any significant noise impacts for existing noise sensitive receptors.

9. Conclusion

A noise assessment has been carried out for the proposed school at **Aviation House, Harmondsworth Lane, Harmondsworth, West Drayton UB7 0LQ**. The proposed scheme involves the conversion of an existing office building to provide a building with SEND education facilities for up to 40 pupils of primary school age (age 4-11).

The noise climate is dominated by very frequent aircraft noise and distant road traffic noise. Additionally, there are occasional local car movements in the existing car park to the north and intermittent plant noise was audible, but not loud.

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 existing external façade should achieve a sound reduction of at least 45 dB – 50 dB R_w.**
    - **Minimum glazing acoustic specification 24 dB R_w, ideally the glazing specification will be at least 29 dB R_w, which is easily achievable with standard double-glazing systems, to achieve the "new build" noise levels for SEN classrooms to assist with speech intelligibility for the hearing impaired.**
    - **An alternative means of ventilation for background ventilation and mitigation of overheating should be installed to prevent the need to open windows for those purposes.**
- External noise levels in playgrounds are below the upper limit of acceptability so should not be a reason for refusal, however fails to achieve the ideal noise level criteria. **It is becoming increasingly common in this area around Heathrow Airport to provide sheltered areas, such as pods, in the playground area to provide a respite area from aircraft noise.**
- Maximum noise rating levels for plant associated with the school building in line with the BS 4142:2014 methodologies. It is recommended that a further, detailed plant noise, assessment is carried out once precise plant specifications have been determined.
- The impact of noise from activity in the proposed play areas. It has been concluded that activity noise levels from the external play areas are not likely to result in any significant noise impacts for existing noise sensitive receptors. Noise from the use of the playgrounds is unlikely to be noticeable at the nearest noise sensitive receptors.

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	*This is the main way of adjusting measured sound pressure levels to take into account human hearing, and our uneven frequency response.*
Decibel (dB)	*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.*
$L_{Aeq,T}$	*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.*
L_{A10}	*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.*
L_{A50}	*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}.*
L_{A90}	*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.*
L_{Amax}	*The 'A'-weighted maximum sound pressure level measured over a measurement period.*

11. Appendix 2: List of Equipment

Equipment Type	Manufacturer	Serial Number	Calibration Certification Number	Date of Last Calibration Check
NL-52 Sound Level Meter	Rion	00264527	TCRT21/1373	June 2021
UC-59 Microphone	Rion	09674	TCRT21/1373	June 2021
NH-25 Preamplifier	Rion	64652	TCRT21/1373	June 2021
NC-75 Calibrator	Rion	34313030	TCRT2**2**/13**90**	June 202**2**

12. Appendix 3: Detailed Noise Measurement Results

Measured Noise levels – MP1 -21.09.2023

Time	$L_{Aeq,T}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
1200-1300	56	58	55
1300-1400	58	61	54
1400-1500	57	60	50
1500-1600	54	57	50
1600-1700	67	70	51
1700-1800	55	59	48
1800-1900	51	54	48
1900-2000	52	53	48
2000-2100	53	55	46
2100-2200	49	50	43
2200-2300	49	50	47
2300-0000	48	50	43
1200-2300	**59**	**57**	**49**
2300-0000	**48**	**50**	**43**

Measured Noise levels – MP1 -22.09.2023

Time	$L_{Aeq,T}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
0000-0100	48	50	47
0100-0200	48	49	44
0200-0300	48	51	48
0300-0400	49	50	44
0400-0500	50	52	52
0500-0600	52	52	52
0600-0700	54	56	55
0700-0800	56	58	54
0800-0900	55	56	54
0900-1000	55	56	50
1000-1100	53	55	53
1100-1200	55	57	50
1200-1300	54	56	53
1300-1400	55	56	52
1400-1500	54	56	49
1500-1600	50	51	48
1600-1700	50	51	48
1700-1800	53	57	48
1800-1900	50	52	48
1900-2000	50	52	48
2000-2100	50	52	48

Time	$L_{Aeq,T}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
2100-2200	50	51	48
2200-2300	50	52	50
2300-0000	52	53	50
0700-2300	**53**	**54**	**50**
2300-0700	**51**	**52**	**49**

Measured Noise levels – MP1 -23.09.2023

Time	$L_{Aeq,T}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
0000-0100	51	52	51
0100-0200	52	52	51
0200-0300	51	51	51
0300-0400	51	52	52
0400-0500	52	52	52
0500-0600	52	52	52
0600-0700	55	57	54
0700-0800	56	58	55
0800-0900	58	59	53
0900-1000	56	57	52
1000-1100	57	58	52
1100-1200	54	56	52
1200-1300	54	56	52
1300-1400	54	56	53
1400-1500	55	57	48
1500-1600	49	50	47
1600-1700	74	80	46
1700-1800	50	52	47
1800-1900	50	52	49
1900-2000	53	56	51
2000-2100	54	56	51
2100-2200	54	56	54
2200-2300	55	56	49
2300-0000	51	52	49
0700-2300	**62**	**57**	**51**
2300-0700	**52**	**52**	**52**

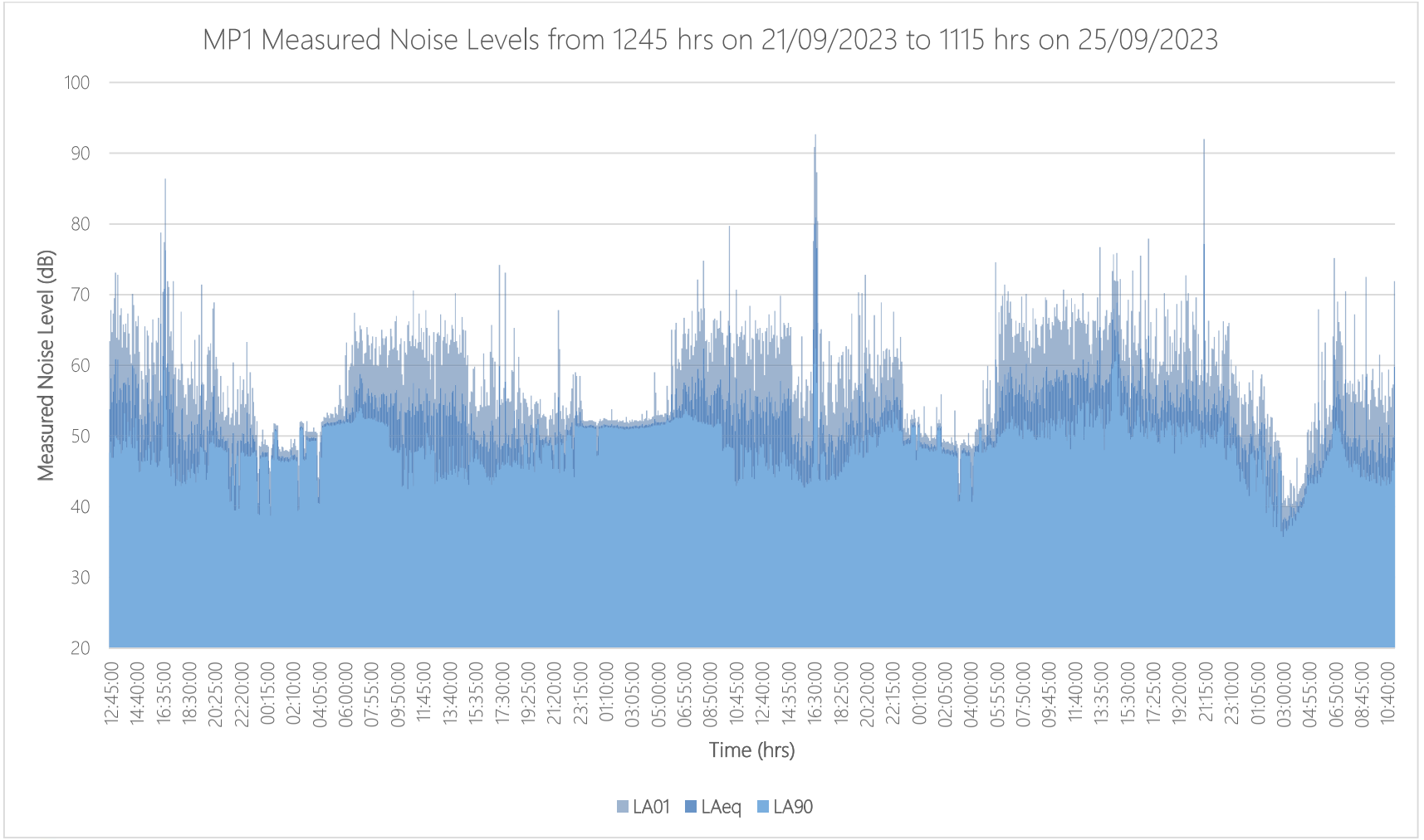
Measured Noise levels – MP1 -24.09.2023

Time	$L_{Aeq,T}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
0000-0100	49	51	49
0100-0200	50	51	48
0200-0300	48	48	45

Time	$L_{Aeq,T}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
0300-0400	47	48	46
0400-0500	49	51	49
0500-0600	53	52	49
0600-0700	56	59	56
0700-0800	57	59	54
0800-0900	56	58	54
0900-1000	57	59	57
1000-1100	58	59	55
1100-1200	58	59	58
1200-1300	59	60	57
1300-1400	59	61	57
1400-1500	64	68	56
1500-1600	58	60	54
1600-1700	58	60	53
1700-1800	57	57	53
1800-1900	56	58	54
1900-2000	56	57	54
2000-2100	56	58	52
2100-2200	67	55	53
2200-2300	55	57	50
2300-0000	52	55	46
0700-2300	**60**	**59**	**54**
2300-0700	**52**	**52**	**49**

Measured Noise levels – MP1 -25.09.2023

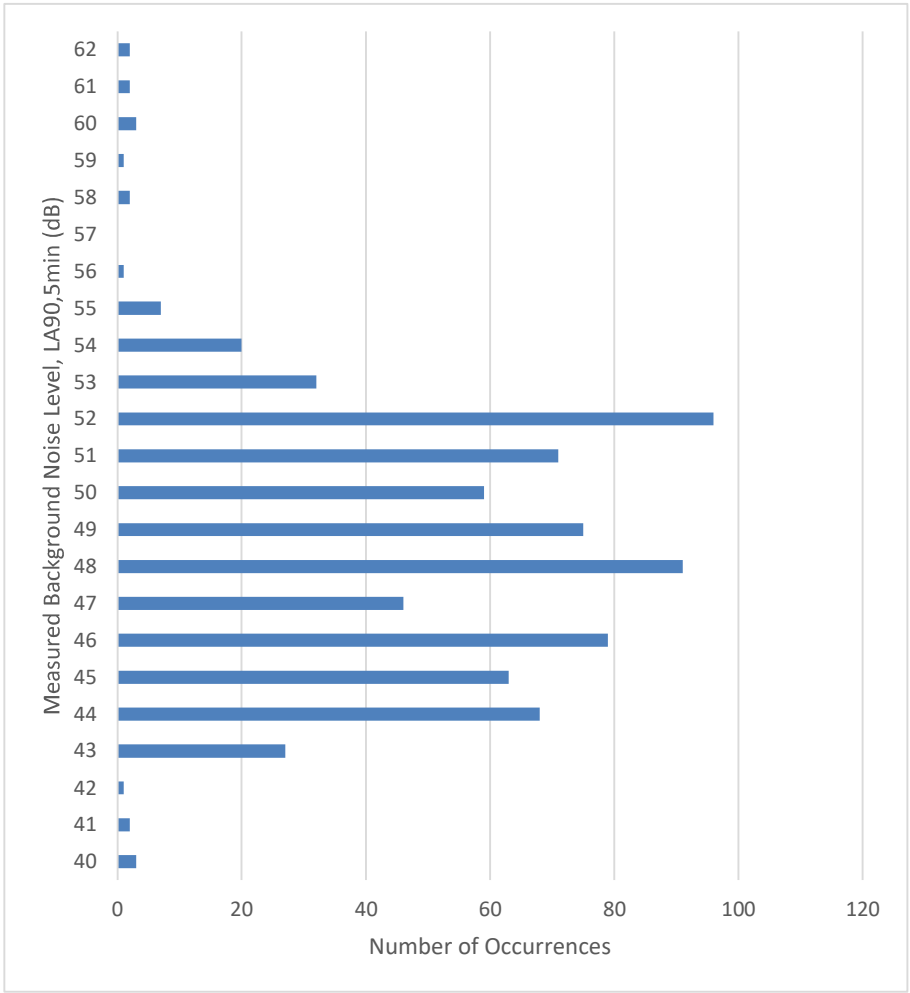
Time	$L_{Aeq,T}$ (dB)	L_{A10} (dB)	L_{A90} (dB)
0000-0100	49	50	48
0100-0200	49	52	42
0200-0300	46	48	38
0300-0400	39	40	39
0400-0500	42	44	45
0500-0600	48	50	47
0600-0700	54	54	51
0700-0800	54	58	49
0800-0900	50	50	47
0900-1000	51	49	46
1000-1100	49	51	47
0700-1100	**51**	**52**	**47**
0000-0700	**49**	**48**	**44**


MP1 Measured Noise Levels from 1245 hrs on 21/09/2023 to 1115 hrs on 25/09/2023
Measured Noise Level (dB)
100
90
80
70
60
50
40
30
20
12:45:00
14:40:00
16:35:00
18:30:00
20:25:00
22:20:00
00:15:00
02:10:00
04:05:00
06:00:00
07:55:00
09:50:00
11:45:00
13:40:00
15:35:00
17:30:00
19:25:00
21:20:00
23:15:00
01:10:00
03:05:00
05:00:00
06:55:00
08:50:00
10:45:00
12:40:00
14:35:00
16:30:00
18:25:00
20:20:00
22:15:00
00:10:00
02:05:00
04:00:00
05:55:00
07:50:00
09:45:00
11:40:00
13:35:00
15:30:00
17:25:00
19:20:00
21:15:00
23:10:00
01:05:00
03:00:00
04:55:00
06:50:00
08:45:00
10:40:00
Time (hrs)
LA01
LAeq
LA90

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

MP1 - Daytime (0700 hrs – 2300 hrs)

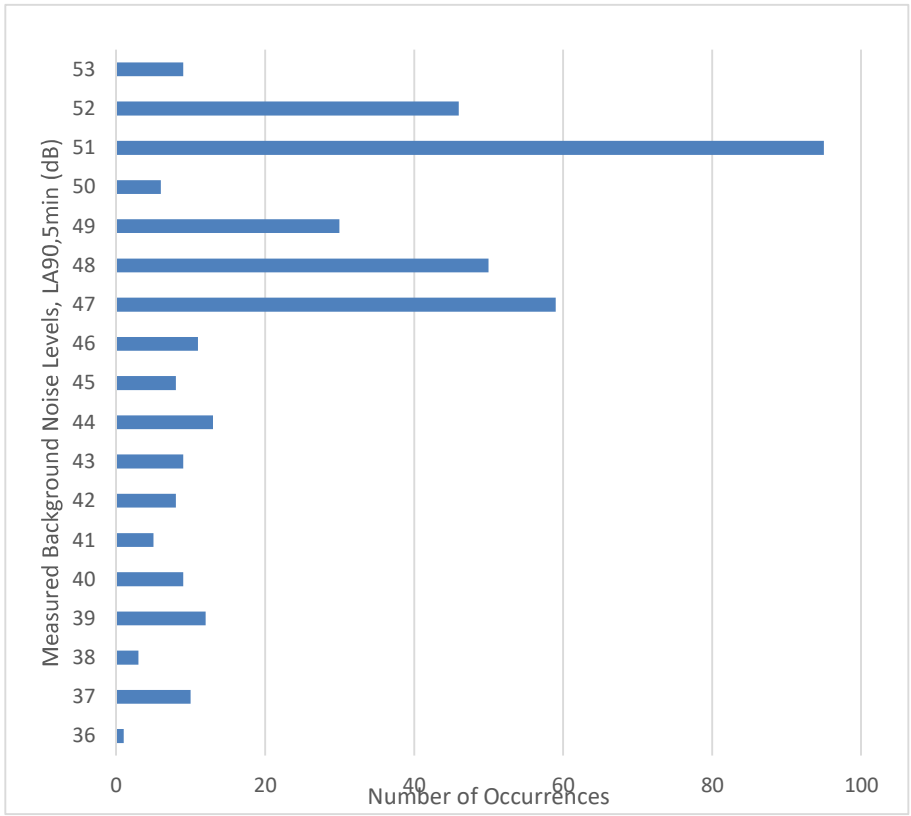
Measured $L_{A90,5min}$ (dB)	Number of Occurrences
40	3
41	2
42	1
43	27
44	**68**
45	63
46	79
47	46
48	91
49	75
50	59
51	71
52	96
53	32
54	20
55	7
56	1
57	0
58	2
59	1
60	3
61	2
62	2



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

Night-time (2300 hrs – 0700 hrs)

Measured $L_{A90,5min}$ (dB)	Number of Occurrences
36	1
37	10
38	3
39	**12**
40	9
41	5
42	8
43	9
44	13
45	8
46	11
47	59
48	50
49	30
50	6
51	95
52	46
53	9



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