

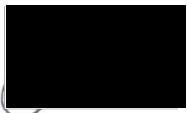
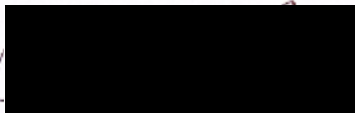
Report for:

The Heights Primary School

Noise Impact Assessment

Status: Final

Date: 13.07.2023

Author	 Daniel Shortt Acoustic Technician
Reviewed and Approved By	 Graham Parry FIOA Managing Director
Report For	The Heights Primary School 129 Upper Woodcote Road Reading Caversham RG4 7LB
Date	13.07.2023
Version Number	A4913/N/001
Status	Final

This report has been prepared by ACCON UK Limited with all reasonable care and diligence within the terms of the contract with the client. We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above. We accept no responsibility to third parties to whom this report, or any part, thereof is made available. Any such party relies upon the report at their own risk.

CONTENTS

1.1. Background.....	5
2. THE NATURE, MEASUREMENT AND EFFECT OF NOISE	7
3. NOISE ASSESSMENT CRITERIA	8
3.1. Noise Policy Statement for England	8
3.2. Planning Practice Guidance.....	8
3.3. Local Authority Policy and Guidance	9
3.4. Noise Guidance	9
3.5. Assessment Criteria for Noise from External School Areas.....	10
4. NOISE MEASUREMENT SURVEY	11
4.1. Results.....	12
5. NOISE IMPACT ASSESSMENT	21
5.1. Predicted Noise Levels	21
5.2. Potential Impacts on NSR's	21
6. SUMMARY	23

LIST OF TABLES

Table 2.1: Typical Noise Levels.....	7
Table 3.3: Indoor Ambient Noise Levels for Dwellings	10
Table 4.1 Noise Survey Locations	13
Table 4.2: Measured noise levels before the lunch period (1120 hrs to 1150 hrs).....	13
Table 4.3: Measured noise levels during the lunch period (1150 hrs to 1320 hrs).....	13
Table 4.4: Measured noise levels after the lunch period (1320 hrs to 1350 hrs).....	13
Table 4.5: Measured noise levels at MP1 in five-minute periods.....	13
Table 4.6: Measured noise levels at MP2 in five-minute periods.....	14
Table 4.7: Measured noise levels at MP1 and MP2.....	17
Table 4.8: After school noise level measurements at MP1 in five-minute periods.....	17
Table 4.9: After school noise level measurements at MP1 in five-minute periods.....	18
Table 5.1: Predicted noise levels at NSR's.....	21
Table 5.2: Predicted internal noise levels with typical glazing specification during the lunch period.....	22
Table 5.3: Measured noise levels versus WHO guidance.....	22

LIST OF FIGURES

Figure 1.1: Site location.....	4
Figure 4.1: MP1 $L_{Aeq, T}$ and L_{AFmax} time history.....	16
Figure 4.2: MP1 $L_{Aeq, T}$ and L_{AFmax} time history.....	17
Figure 4.3: MP1 $L_{Aeq, T}$ and L_{AFmax} time history after school.....	19
Figure 4.4: MP2 $L_{Aeq, T}$ and L_{AFmax} time history after school.....	19

LIST OF APPENDICES

Appendix 1 Glossary of Acoustic Terminology	26
---	----

INTRODUCTION

1.1. Background

ACCON UK Limited (ACCON) has been commissioned by The Heights Primary School to undertake a noise impact assessment to determine the potential noise impacts in respect of accommodating additional pupils in the schools' outdoor recreational areas on the neighbouring residential properties.

The school was planned on the basis of a 2FE primary, with classes of 25. The planning permission description is specifically limited to this number of pupils. The proposal is to increase its Published Admission Number (PAN) by 5 pupils per class, which would increase the number of pupils attending the school by 70, bringing the total number of pupils at the school to 420.

The site is located within the administrative boundary of Reading Borough Council (RBC). **Figure 1.1.** provides the site location and the nearest noise sensitive receptors (NSR's), which are located at 28 and 29 Hewett Avenue.

Figure 1.1: Site location



1.2. Response from the Environmental Health Officer

Comments from the Environmental Health Officer (EHO) in respect to the proposed increase in Pupil Admission Number (PAN), Reference 230290, dated 27th March 2023, are provided below:

Noise generating development.

The Environmental Protection and Nuisance team has received a number of complaints about noise from outdoor activities at the school, in particular from the playground and the MUGA. Our investigations and measurements taken indicate that the noise levels in the gardens of the affected properties are close to the World Health Organisation suggested upper limit of 55 dBA for external amenity areas. Therefore we are concerned about any increase to this noise level or increase in the time that this noise level may occur for.

I understand that a desk-based study is proposed for the application to determine if noise levels are likely to be affected by the proposal. I would also welcome analysis of the feasibility of installing acoustic treatment to the boundary of the MUGA.

Accordingly, this noise impact assessment responds to the response provided by the EHO.

2. THE NATURE, MEASUREMENT AND EFFECT OF NOISE

Noise is often defined as sound that is undesired by the recipient. Whilst it is impossible to measure nuisance caused by noise directly, it is possible to characterise the loudness of that noise. 'Loudness' is related to both sound pressure and frequency, both of which can be measured. The human ear is sensitive to a wide range of sound levels. The sound pressure level of the threshold of pain is over a million times that of the quietest audible sound. In order to reduce the relative magnitudes of the numbers involved, a logarithmic scale of decibels (dB) is normally used, based on a reference level of the lowest audible sound.

The response of the human ear is not constant over all frequencies. It is therefore usual to weight the measured frequencies to approximate the human response. The resulting 'A' weighted decibel, dB(A), has been shown to correlate closely to the subjective human response.

When related to changes in noise, a change of ten decibels, for example from 60 dB(A) to 70 dB(A), would represent a doubling in 'loudness'. Similarly, a 10 dB(A) decrease in noise, for example from 70 dB(A) to 60 dB(A), would represent a halving in 'loudness'. A change of 3 dB(A) is generally considered to be just perceptible¹. **Table 2.1** provides typical noise levels of common sources.

Table 2.1: Typical Noise Levels

Approximate Noise Level (dB(A))	Example
0	Limit of hearing
30	Rural area at night
40	Library
50	Quiet office
60	Normal conversation at 1 m
70	In car noise without radio
80	Household vacuum cleaner at 1 m
100	Pneumatic drill at 1 m
120	Threshold of pain

A Glossary of Acoustic Terminology is provided in **Appendix 1**.

¹ Institute of Environmental Management and Assessment (2014). Guidelines for environmental noise impact assessment.

3. NOISE ASSESSMENT CRITERIA

This section of the report identifies relevant National and Local Authority policy and guidance. Additionally, appropriate British Standards and guidance documents are also referenced.

3.1. 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”.*

Based on concepts from toxicology, it introduces three ‘Effect Levels’ relevant to the assessment of noise. These are:

- NOEL: No Observed Effect Level: This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise;
- LOAEL: Lowest Observed Adverse Effect Level: This is the level above which adverse effects on health and quality of life can be detected; and
- SOAEL: Significant Observed Adverse Effect Level: This is the level above which significant adverse effects on health and quality of life occur.

3.2. Planning Practice Guidance

The Planning Practice Guidance for Noise (PPG-N) was published in March 2014 and most recently updated in July 2019. The PPG-N suggests that the most appropriate and cost-effective solutions to potential noise issues are best identified when good acoustic design is considered early in the planning process.

The PPG-N provides the following 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.” (Paragraph 003 Reference ID 30-003-20190722)

The document goes on to acknowledge the levels of noise exposure at which an effect may occur as provided in the NPSE and introduces a fourth effect level:

- UAE: Unacceptable Adverse Effect: Extensive and regular changes in behaviour and/or an inability to mitigate the effect of noise lead to psychological stress or physical effects.

It is important to understand that as the PPG-N does not specifically provide any advice with respect to 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 and the PPG-N signposts a number of appropriate guidance documents.

3.3. Local Authority Policy and Guidance

3.3.1. Reading Borough Council

Reading Borough Council's Local Plan (2019 to 2036) was adopted in November 2019. The relevant policy with respect to noise is reproduced below.

EN16: POLLUTION AND WATER RESOURCES

Development will only be permitted where it would not be damaging to the environment and sensitive receptors through land, noise, or light pollution; where it would result in no deterioration in, or ideally enhance, ground and surface water quality; and where adequate water resources, sewerage and wastewater treatment infrastructure will be in place to support the proposed development prior to occupation.

Proposals for development that are sensitive to the effects of noise or light pollution will only be permitted in areas where they will not be subject to high levels of such pollution unless adequate mitigation measures are provided to minimise the impact of such pollution.

3.4. Noise Guidance

3.4.1. British Standard BS 8233:2014

BS 8233 *Guidance on sound insulation and noise reduction for buildings* has a number of design criteria for intrusive external noise without a specific character. In lieu of more specific guidance for noise from nurseries, this standard had been utilised in order to determine the impact on occupiers of residential properties around the proposed nursery. The guidelines are designed to achieve reasonable resting/sleeping conditions in bedrooms and good listening conditions in other rooms. The most appropriate noise levels for the residential environment are reproduced in **Table 3.1**. The guideline values for external noise levels are also considered applicable for the proposed increase in the PAN.

Table 3.1: Indoor Ambient Noise Levels for Dwellings

Activity	Location	Daytime	Night-time
		0700 hrs to 2300 hrs	2300 hrs to 0700 hrs
Resting	Living room	35 dB $L_{Aeq,16hr}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$

Although there are no limits set for external noise levels in BS 8233 the following guidance is provided at paragraph 7.7.3.2:

“For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces but should not be prohibited.”

3.5. 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 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. The proposed acceptability criteria are outlined in **Table 3.2** below.

Table 3.2: Summary of Noise Criteria: BS 8233 & WHO

	Criterion	Location	Ambient Noise Level $L_{Aeq,T}$
WHO	To prevent annoyance in external amenity areas	Outside dwellings	55
BS 8233	To ensure a reasonable resting condition inside living rooms	Internal	35

It should be noted that the above criteria relate to the daytime period, which is normally defined as 0700 hours to 2300 hours.

4. NOISE MEASUREMENT SURVEY

Attended noise measurements were carried out on two separate occasions on Wednesday 14th June 2023 and on Monday 10th July 2023 in order to obtain noise measurement data from the recreational play areas whilst the lunch period and after school club took place.

Noise measurements were obtained before, during and after the lunch time period (1150hrs to 1320hrs) in order to assess the impact the period and outside activities have on the ambient noise levels at the NSR's. Noise measurements were also obtained at the end of the school day (1455 hrs to 1625hrs) in order to assess the impact that the after-school club has on the ambient noise levels at the NSR's.

The lunch period at the Heights Primary School runs for a total of one and a half hours (1150hrs to 1320 hrs). Classes are staggered over the course of the lunch period meaning that there is only a certain number of children in the recreational areas at a certain time.

The after-school club runs from the end of the school day at 1500hrs to 1800hrs, and it is based from the schools dining hall and from a classroom, although the children also use the external recreational areas whilst attending the after-school club for activities.

Both sets of noise measurements used two Class 1 Sound Level Meters (SLM's): Two Norsonic 118 SLM's. Both of the sound level meters hold current certificates of calibration, which are available upon request. The equipment was field calibrated before and after the noise measurement periods to ensure that they remained within reasonable calibration limits (± 0.5 dB).

At the start of the noise measurement period on the 14th June 2023 the weather was dry with no cloud cover with a daytime temperature of 22°C and a south-westerly wind with speeds of 2 m/s and gusts of up to 3m/s.

At the end of the noise measurements on the 14th June 2023, the weather was dry, with no cloud cover and a daytime temperature of 26°C. There was a south-westerly wind with speeds of 2 m/s and gusts of up to 4 m/s. Weather conditions throughout the noise survey were suitable for noise measurements.

At the start of the noise measurement period on the 10th July 2023 the weather was dry with 85% cloud cover with a daytime temperature of 22°C and a northerly wind with speeds of 4 m/s and gusts of up to 5 m/s.

At the end of the noise measurements on the 10th July 2023, the weather was dry, with 100% cloud cover and a temperature of 22°C. There was a northerly wind with speeds of 4.5 m/s and gusts of up to 5 m/s. Weather conditions throughout the noise survey were suitable for noise measurements.

The noise measurement locations, which were chosen to be representative of the free-field noise levels in the vicinity of the NSR's, are identified in **Figure 4.1** and described in **Table 4.1**.

Figure 4.1: Noise Measurement Locations



Table 4.1 Noise Survey Locations

Location Reference	Location Description	Measurement Duration	Observed Noise Sources
MP1	Located approximately 20 metres west of the Heights Primary School, in line with the windows at the rear of 29 Hewett Avenue.	1 x 2.5 hours 1 x 1.5 hours	Noise from the Heights Primary School, occasional road traffic noise from Hewett Avenue.
MP2	Located approximately 15 metres west of the southernmost play area of the Heights Primary School in line with the windows at the rear of 28 Hewett Avenue	1 x 2.5 hours 1 x 1.5 hours	Noise from the Heights Primary School and from the Mapledurham Playing Fields

4.1. Lunch Time Measurement Results

The noise levels measured on the 14th June 2023 have been divided into three separate time periods; measured noise levels before the lunch period, the measured noise levels during the lunch period, and the measured noise levels after the lunch period. These values are

summarised in **Table 4.2**, **Table 4.3**, and **Table 4.4** respectively. **Table 4.5** and **Table 4.6** summarises the measured noise levels in five-minute periods.

Table 4.2: Measured noise levels before the lunch period (1120 hrs to 1150 hrs)

Measurement Position	L _{Aeq,T} (dB)	L _{AFmax} (dB)	L _{A10,T} (dB)	Mean L _{A90,T} (dB)
MP1	45	69	47	39
MP2	43	61	44	38

Table 4.3: Measured noise levels during the lunch period (1150 hrs to 1320 hrs)

Measurement Position	L _{Aeq,T} (dB)	L _{AFmax} (dB)	L _{A10,T} (dB)	Mean L _{A90,T} (dB)
MP1	52	76	53	44
MP2	58	79	60	50

Table 4.4: Measured noise levels after the lunch period (1320 hrs to 1350 hrs)

Measurement Position	L _{Aeq,T} (dB)	L _{AFmax} (dB)	L _{A10,T} (dB)	Mean L _{A90,T} (dB)
MP1	45	74	46	40
MP2	53	81	54	44

Table 4.5: Measured noise levels at MP1 in five-minute periods

Time Period	L _{Aeq,5min} (dB)	L _{AFmax} (dB)	L _{A10,5min} (dB)	Mean L _{A90,5min} (dB)
1125-1130	44	57	46	37
1130-1135	46	57	49	40
1135-1140	44	53	45	40
1140-1145	47	69	48	41
1145-1150	46	62	49	38
1150-1155	43	54	45	40
1155-1200	45	57	50	40

1200-1205	50	67	52	43
1205-1210	50	65	52	43
1210-1215	53	59	45	45
1215-1220	55	72	56	48
1220-1225	54	69	55	46
1225-1230	50	64	53	45
1230-1235	54	71	56	47
1235-1240	56	76	59	48
1240-1245	56	73	59	50
1245-1250	56	75	58	47
1250-1255	53	72	55	45
1255-1300	51	66	53	45
1300-1305	48	63	49	43
1305-1310	46	65	48	40
1310-1315	46	61	49	41
1315-1320	47	62	49	41
1320-1325	43	56	45	39
1325-1330	47	74	46	39
1330-1335	44	56	47	40
1335-1340	44	55	46	41
1340-1345	44	59	46	41
1345-1350	45	57	48	40

Table 4.6: Measured noise levels at MP2 in five-minute periods

Time Period	L _{Aeq,T} (dB)	L _{AFmax} (dB)	L _{A10,5min} (dB)	Mean L _{A90,5min} (dB)
1120-1125	42	60	44	39
1125-1130	41	51	43	37

1130-1135	45	61	46	39
1135-1140	42	55	43	38
1140-1145	44	55	45	37
1145-1150	42	54	44	37
1150-1155	45	60	48	41
1155-1200	51	61	47	38
1200-1205	55	72	58	46
1205-1210	55	69	58	49
1210-1215	58	62	52	52
1215-1220	60	76	62	53
1220-1225	59	77	62	53
1225-1230	59	73	62	53
1230-1235	60	78	63	53
1235-1240	59	71	62	53
1240-1245	63	78	65	54
1245-1250	61	76	64	54
1250-1255	62	79	64	53
1255-1300	58	76	61	52
1300-1305	57	71	60	50
1305-1310	55	72	58	47
1310-1315	54	72	57	47
1315-1320	50	64	52	44
1320-1325	46	61	48	40
1325-1330	50	69	53	44
1330-1335	49	62	52	42
1335-1340	53	69	56	46
1340-1345	57	81	58	46

Figure 4.1 identifies the $L_{Aeq,T}$ and L_{AFmax} time history for MP1, and **Figure 4.2** identifies the $L_{Aeq,T}$ and L_{AFmax} time history for MP2.

Figure 4.1 $L_{Aeq,T}$ and L_{AFmax} lunch period time history: MP1

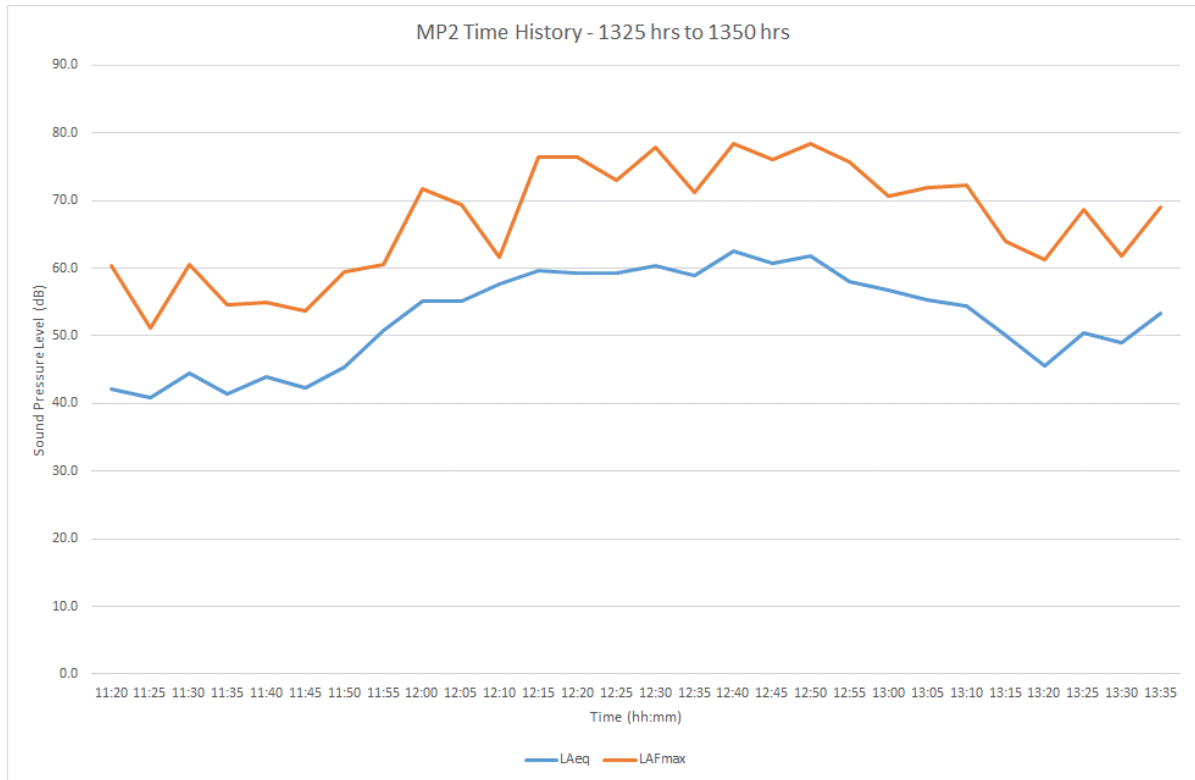
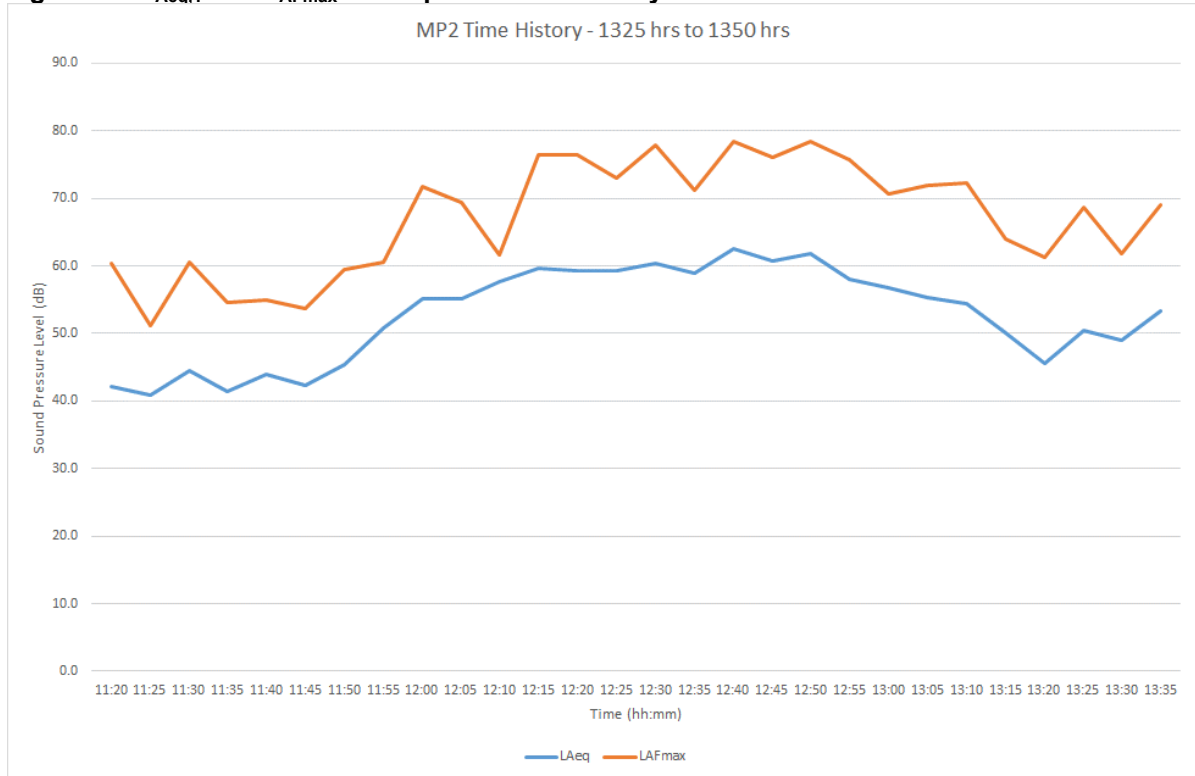


Figure 4.2 $L_{Aeq,T}$ and L_{AFmax} lunch period time history: MP2



4.2. After School Measurement Results

The noise levels measured on the 10th July 2023 at MP1 and MP2 have been summarised in **Table 4.7**. **Table 4.8** and **Table 4.9** identify the measured noise levels in five-minute samples.

Table 4.7: Measured noise levels at MP1 and MP2

Measurement Position	$L_{Aeq,T}$ (dB)	L_{AFmax} (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
MP1	51	68	52	47
MP2	56	78	58	50

Table 4.8: After school noise level measurements at MP1 in five-minute periods

Time Period	$L_{Aeq,T}$ (dB)	L_{AFmax} (dB)	$L_{A10,T}$ (dB)	$L_{A90,T}$ (dB)
1455-1500	48	68	49	45
1500-1505	47	62	49	45
1505-1510	49	60	51	47
1510-1515	50	63	51	47

1515-1520	49	58	52	46
1520-1525	53	66	54	49
1525-1530	51	60	52	49
1530-1535	53	66	54	50
1535-1540	50	61	52	47
1540-1545	51	64	53	46
1545-1550	52	61	54	51
1550-1555	51	64	52	47
1555-1600	50	60	52	49
1600-1605	52	60	54	49
1605-1610	49	62	50	47
1610-1615	52	65	53	47
1615-1620	50	63	52	46
1620-1625	51	65	53	47

Table 4.9: After school noise level measurements at MP2 in five-minute periods

Time Period	L _{Aeq,T} (dB)	L _{AFmax} (dB)	L _{A10,T} (dB)	L _{A90,T} (dB)
1455-1500	54	71	56	47
1500-1505	55	70	57	49
1505-1510	55	70	57	49
1510-1515	56	71	57	51
1515-1520	56	69	58	52
1520-1525	54	68	56	50
1525-1530	57	71	59	52
1530-1535	57	71	59	52
1535-1540	53	77	54	48
1540-1545	54	67	56	49
1545-1550	57	69	60	51

1550-1555	55	78	56	49
1555-1600	55	74	55	49
1600-1605	55	74	57	50
1605-1610	55	75	57	50
1610-1615	57	76	59	51
1615-1620	59	71	62	51
1620-1625	56	78	59	51

Figure 4.1 identifies the $L_{Aeq,T}$ and L_{AFmax} time history for the MP1, and **Figure 4.4** identifies the $L_{Aeq,T}$ and L_{AFmax} time history for MP2 respectively.

Figure 4.3: MP1 $L_{Aeq,T}$ and L_{AFmax} after school time history

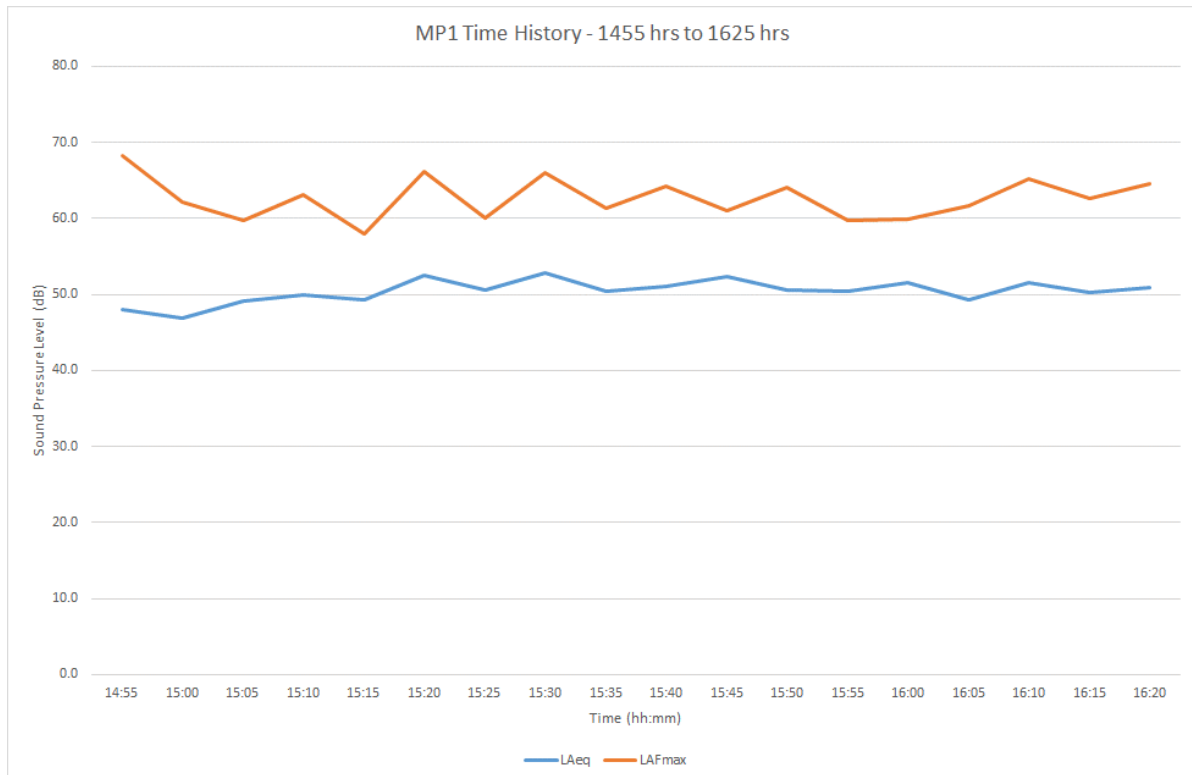
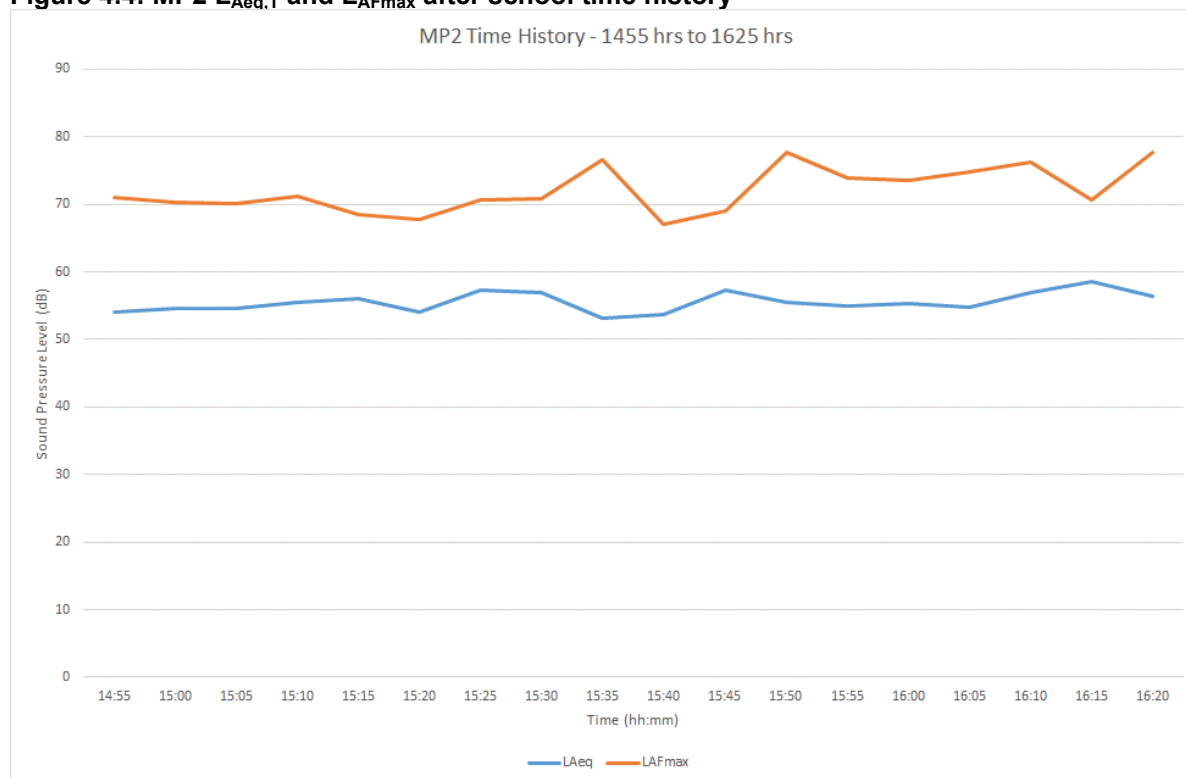


Figure 4.4: MP2 $L_{Aeq,T}$ and L_{AFmax} after school time history



The after-school club consisted of a small number of children playing in the recreational areas from 1530 hrs onwards, with approximately 10 children participating. Noise from the after-school club was particularly noticeable at MP1 at 1550hrs, 1552hrs and 1553hrs. Noise from the after-school club was noticeable at MP2 from when it first commenced until the end of the measurement period.

Towards the start of the noise measurements a low flying helicopter was audible at both MP1 and MP2. Aircraft noise was audible at MP1 at various times throughout the measurements (1515hrs, 1517hrs, 1523hrs, 1543hrs, 1548hrs, 1558hrs, 1614hrs and 1622hrs). Also audible at MP1 was a noisy petrol-powered lawn mower, that was audible from 1524hrs until 1551hrs. Cars parking and passing by were also audible at MP1 throughout the course of the noise measurements.

Noise from parents and guardians picking their children up at the end of the school day at 1500hrs was clearly audible from MP2. Additionally, noise from a children's play area located on the Mapledurham Playing Fields approximately 60 metres from the measurement position was also audible throughout the measurement period and was particularly noticeable from 1500hrs to 1530hrs when the pupils were being collected at the end of the school day.

From 1610hrs to 1625hrs, the wind speed increased which resulted in noise from nearby trees and bushes contributing more to the overall noise climate at both MP1 and MP2.

5. NOISE IMPACT ASSESSMENT

5.1. Predicted Noise Levels

ACCON previously conducted noise measurements in 2017 to assess the noise constraints and impacts prior to the school's construction in order to assess the impact that the then proposed and its outdoor activities school would have on the NSR's.

Table 5.1 below provides the predicted noise levels at the NSR's from the report (Reference A2958/N/001) that were derived from the measurement data.

Table 5.1: Predicted noise levels at NSR's

Receptor	Noise Level arising from the playground	
	Average (L_{Aeq})	Highest (L_{AFmax})
28 Hewett Avenue	54	69
29 Hewett Avenue	55	70

Table 5.1 identifies the predicted noise levels of 54 L_{Aeq} dB and 55 L_{Aeq} dB for the residential properties at 28 and 29 Hewett Close. **Table 4.3** identifies that the measured $L_{Aeq,T}$ levels at MP1 and MP2 are 52 dB and 58 dB respectively, which indicates that the measured noise levels align well with the predicted noise levels at 28 and 29 Hewett Close.

5.2. Potential Impacts on NSR's

In order to predict the noise level increase in pupil related noise emitted from recreational areas at the school with the proposed number of additional pupils, the following equation has been used:

$$\text{Predicted Noise Level (dB)} = 10 \log \frac{\text{Proposed number of pupils}}{\text{Current number of pupils}}$$

Where:

- Proposed number of pupils = 420
- Current number of pupils = 350

The addition of the proposed 70 extra pupils spread across the recreational areas would lead to a negligible increase in period noise levels of 0.8 dB, which would not be perceptible to occupiers of properties in Hewett Avenue. The maximum noise levels are not expected to change.

5.3. BS 8233

Although BS 8233 uses the $L_{Aeq,16hr}$ to assess indoor ambient noise levels during the daytime, the guidance given in the standard can be considered as useful for assessing indoor ambient

noise levels for the dwellings at 28 and 29 Hewett Avenue for when the recreational areas are occupied by the pupils. **Table 3.1** identifies the target indoor ambient noise levels that are provided in the standard.

The predicted internal noise levels for the dwellings at each measurement position during the lunch period are provided in **Table 5.2**. This has been predicted assuming the dwellings at 28 and 29 Hewett Avenue are fitted with standard double-glazed windows that achieve a minimum 28 dB reduction from outside to inside.

Table 5.2: Internal noise levels with typical glazing specification during the lunch and after school period

Receptor	Lunch Period		After School	
	Period $L_{Aeq,T}$ minus 28 dB	Measured L_{AFmax} minus 28 dB	Period $L_{Aeq,T}$ minus 28 dB	Measured L_{AFmax} minus 28 dB
28 Hewett Avenue	24	48	23	40
29 Hewett Avenue	30	51	28	50

5.4. WHO Guidelines

Table 5.3 compares the measured noise levels during the lunch time period and during the time the after-school club runs.

Table 5.3: Measured noise levels compared to the WHO guidance.

Monitoring Position	WHO Criterion for Ambient Noise Level for Outside Dwellings (dB)	Measured $L_{Aeq,T}$ (Lunch Period)	Measured $L_{Aeq,T}$ (After-School)	Comments
MP1	$L_{Aeq,T} \leq 55 \text{ dB(A)}$	52	51	Measured $L_{Aeq,T}$ values for MP1 do not exceed the WHO criteria, but the levels measured at MP2 are in exceedance. ⁽¹⁾
MP2		58	56	

⁽¹⁾The noise levels only exceed the criterion during these periods when the school play areas are being used, and when averaged over the normal 16-hour criterion period would be less than 55 $L_{Aeq,16hr}$.

6. SUMMARY

A noise impact assessment has been carried out at the Heights Primary School to assess the potential impacts of accommodating additional pupils in outdoor recreational areas on the neighbouring residential properties.

The impact of noise from activity in the recreational areas has been assessed during the lunch time period and during the time when the after-school club operates.

Whilst current noise levels at MP2 may exceed guidance provided by the WHO, a +0.8 dB predicted increase on the 58 dB $L_{Aeq,T}$ and 56 dB $L_{Aeq,T}$ noise levels measured during the lunch period and the after-school period will not result in any adverse impact.

The predicted internal noise levels for habitable rooms at 28 and 29 Hewett Avenue identified in **Table 5.3** do not exceed the 35 dB guidance identified in BS8233:2014 for when the lunch period and the after-school club operates. Accordingly, the current noise levels are not considered to result in any adverse impact to the neighbouring residential properties.

The indoor ambient noise levels at 28 and 29 Hewett Avenue when taking into account the +0.8 dB predicted increase in noise levels for the proposed increase in the PAN from 350 pupils to 420 pupils will still be considerably below the 35 dB $L_{Aeq,16hr}$ identified in BS8233:2014, with predicted indoor noise levels being no more than 31 dB during the lunch period and 29 dB during when the after-school club operates.

Accordingly, the proposed increase in the PAN would not have an adverse noise impact on the occupiers of neighbouring residential properties.

APPENDICES

Appendix 1

Glossary of Acoustic Terminology

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. A 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.
Ambient Sound Level, $L_{Aeq,T}$	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.
Background Sound Level, $L_{A90,T}$	The 'A'-weighted sound pressure level of the residual noise in decibels exceeded for 90 per cent of a given time (T). The $L_{A90,T}$ is used to describe the background noise levels at a particular location.
Maximum Noise Level, L_{AFmax}	The 'A'-weighted maximum sound pressure level measured over a measurement period, measured with a fast time-weighting.



Email: enquiry@accon-uk.com

Reading Office:

Unit B, Fronds Park,
Frouds Lane, Aldermaston,
Reading, RG7 4LH
Tel: 0118 971 0000 Fax: 0118 971 2272

Brighton Office:

Citibase, 95 Ditchling Road,
Brighton, East Sussex, BN1 4ST
Tel: 01273 573 814

www.accon-uk.com