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The Girl's Day School Trust, Maxwell Rd, London HA6 2YE

Planning Compliance Report
Report 24405.PCR.01

The Girl's Day School Trust
Maxwell Rd
London
HA6 2YE

Report 24405.PCT.01 Revision History			
First Issue Date: 01/12/2022			
A	19/12/2022 Included MUGA1 assessment, details on site background, development proposals	D	
B		E	
C		F	

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List of Attachments

1.0 INTRODUCTION

KP Acoustics Ltd has been commissioned by The Girl's Day School Trust, Maxwell Rd, London, HA6 2YE, to undertake a noise impact assessment of the existing Multi Use Games Areas (MUGA1 and MUGA2) to extend the permitted hours of operation, as part of The Girl's Day School Trust, Northwood, upon surrounding noise sensitive receivers.

2.0 NOISE IMPACT ASSESSMENT AND DEVELOPMENT PROPOSALS OF SPORTS FACILITIES

2.1 Site Description

As shown in Figure 1, the site is bounded by residential buildings to the north, residential dwellings to the west, Maxwell Rd and residential dwellings to the south, and Maxwell Rd. and residential dwellings to the east.

It's understood that site has planning permission for an existing sports facility, which was granted under application ref. 2082/APP/2007/1411. Condition 13 of this decision restricts the use of the MUGA exclusively to the school. Condition 12 of this decision permits the use of the MUGA between:

- Monday to Saturday – 09.00 to 18.00; and
- Sunday/ Bank Holidays – no use

Figure 1 Site Location Plan (Image Source: Google Maps)

Initial inspection of the site revealed that the background noise profile at the monitoring location was typical of an urban cityscape environment, with the dominant source being road traffic noise from the surrounding roads.

2.2 Development Proposals

The development proposal seeks to vary condition 12 and condition 13 of planning permission ref. 2082/APP/2007/1411 to allow the existing multi use games area to be utilised by community users and extend the permitted hours to the following times:

- Monday to Friday – 09.00 to 21.00;
- Saturday – 09.00 to 18.00;
- Sunday – 10.00 to 16.00; and
- Bank Holidays – no use

2.3 Noise Impact Measurement Positions

Continuous automated monitoring was undertaken for the duration of the noise survey between 13:11 on 11/11/2022 and 22:01 on 14/11/2022.

The environmental noise measurement position, locations for multi use games areas, and the closest noise sensitive receivers relative to the MUGA1 and MUGA2 are described within Table 1 and shown within Figure 2 and Figure 3.

Icon	Descriptor	Location Description
	Noise Measurement Position	The microphone was installed on a tripod in a free field position, at least 1.5M from any surface, near the MUGA 2 facility.
	Attended measurement position	The microphone was installed on a tripod in a free field position, 1 metre from the sport/play activity location
	Closest Noise Sensitive Receiver	The closest noise sensitive receivers have been identified as front façade windows of residential dwellings surrounding Myrtleside Cl..
	Facilities Locations	MUGA2 and MUGA1 locations are shown in Figure 2 and Figure 3

Table 1 Measurement position and description

Figure 2 Site measurement position 1, identified receivers and sports facilities installation (Image Source: Google Maps)

Figure 3 Site measurement position 2, identified receivers and sports facilities installation (Image Source: Google Maps)

The choice of the measuring positions was based both on accessibility and on collecting representative noise data in relation to the nearest noise sensitive receiver relative to the sports facilities currently in operation.

Weather conditions were generally dry with light winds and therefore suitable for the measurement of environmental noise. The measurement procedure complied with ISO 1996-2:2017 Acoustics '*Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels*'.

2.4 Equipment

The equipment calibration was verified before and after use and no abnormalities were observed. The equipment used is described within Table 2.

Measurement instrumentation		Serial no.	Date	Cert no.
Noise Kit 29	NTI Audio XL2 Class 1 Sound Level Meter	A2A-21120-E0	21/07/2022	UK-22-065
	Free-field microphone NTI Acoustics MC230A	A23073		
	Preamp NTI Acoustics MA220	11033		
	NTI Audio External Weatherproof Shroud	-	-	-
Noise Kit 30	NTI Audio XL2 Class 1 Sound Level Meter	A2A-21149-E0	04/08/2022	UK-22-079
	Free-field microphone NTI Acoustics MC230A	A23572		
	Preamp NTI Acoustics MA220	10997		
	NTI Audio External Weatherproof Shroud	-	-	-
Larson Davis CAL200 Class 1 Calibrator		17148	18/03/2022	UCRT22/1397

Table 2 Measurement instrumentation

3.0 RESULTS

The $L_{Aeq:\,5min}$, $L_{Amax:\,5min}$, $L_{A10:\,5min}$ and $L_{A90:\,5min}$ acoustic parameters were measured throughout the duration of the survey. Measured levels are shown as a time history in Figure 24405.TH1.

3.1 Noise Data

Environmental Noise Survey

Measured noise levels, presented in Table 4, are representative of noise exposure levels expected to be experienced by the front façade of the adjacent residential receiver during the proposed extended weekday and Sunday hours, as identified within Figure 2 and Figure 3.

Time Period	Noise Measurement MUGA1 Position Measured Noise level – dB(A)	Noise Measurement MUGA2 Position Measured Noise level – dB(A)
Extended weekday hours $L_{Aeq,3\ hour}$ (18:00 to 21:00)	49	45
Sunday Hours $L_{Aeq,6\ hour}$ (10:00 to 16:00)	51	51

Table 4 Site average noise levels during proposed extended weekday and Sunday hours.

3.2 Noise Assessment Guidance

IMEA Guidelines for Environmental Noise Impact Assessment

It is our professional opinion that the noise criteria should be based on the noise profile of the area at the receiver as per IMEA Guidelines for Environmental Noise Impact Assessment Version 1.2 (November 2014), in order to ensure that the amenity of the noise sensitive receiver is protected.

To determine the overall noise impact, IEMA guidance presents the combination of magnitude and sensitivity criteria into a Degree of Effect matrix as shown in Table 5 with the corresponding descriptor in Table 6.

		IMPORTANCE/SENSITIVITY OF RECEPTOR			
		High	**Medium**	**Low**	**Negligible**
MAGNITUDE/SCALE OF CHANGE	**Large**	Very Substantial	Substantial	Moderate	None
	Medium	Substantial	Substantial	Moderate	None
	Small	Moderate	Moderate	Slight	None
	Negligible	None	None	None	None

Table 5 Degree of effect matrix

Very Substantial	Greater than 10 dB L_{Aeq} change in sound level perceived at a receptor of great sensitivity to noise
Substantial	Greater than 5 dB L_{Aeq} change in sound level at a noise-sensitive receptor, or a 5 to 9.9 dB L_{Aeq} change in sound level at a receptor of great sensitivity to noise
Moderate	A 3 to 4.9 dB L_{Aeq} change in sound level at a sensitive or highly sensitive noise receptor, or a greater than 5 dB L_{Aeq} change in sound level at a receptor of some sensitivity
Slight	A 3 to 4.9 dB L_{Aeq} change in sound level at a receptor of some sensitivity
None	Less than 2.9 dB L_{Aeq} change in sound level and/or all receptors are of negligible sensitivity to noise or marginal to the zone of influence of the proposals

Table 6 Effect descriptor

Taking into account the residential building receivers would be considered as medium-high sensitive receiver, we would recommend that the noise generated by the activities within the school MUGA2 should not create more than a 3dB change the current ambient noise of the area over the operating hours, in order to maintain the 'none' effect category.

Taking into account the residential building receiver would be considered as medium-high sensitive receiver.

3.3 Noise Impact Calculations

Table 7 shows the results of the predictions of the noise levels of the MUGA1 and MUGA2 at the closest noise sensitive receiver during the extended weekday and Sunday hours.

The received sound pressure level of sports/play noise within the MUGA1 and MUGA2 has been calculated at 1m from the closest receiver using the noise levels shown in Appendix B1 and Appendix B2 and corrected due to acoustic propagation features such as distance and attenuation due to barriers. This is shown for both, the proposed weekday extended hours and Sunday hours.

Noise levels from the MUGA1 and MUGA2 facilities has been assessed following the IMEA Guidelines for Environmental Noise Impact Assessment.

As shown in Table 7, sports/play on the MUGA1 and MUGA2 facilities within the school site would be expected to create 0 - 0.3 dB increase in background noise levels at the residential receivers, thereby falling in the 'none' effect category according to IEMA guidelines.

Considering this, alongside its limited hours of use and its position within an established school location of existing school/playground noise, MUGA1 and MUGA2 use would be considered

to be in full compliance with all relevant standards and have no negative noise impact upon surrounding residential receivers during the proposed extended hours of operation.

Time Period	Predicted noise levels at the receiver dB(A)- MUGA1	Predicted noise levels at the receiver dB(A)- MUGA2
Average measured ambient noise level- dB(A) (Weekday evening proposed hours)	49	45
Average measured ambient noise level- dB(A) (Sunday proposed hours)	51	51
Noise level at the receiver due to MUGA activity	12	33
Combined sound pressure level at receiver (Weekday evening proposed hours)	49.0	45.3
Combined sound pressure level at receiver (Sunday proposed hours)	51.0	51.1
Noise level change (Weekday evening proposed hours)	0.0	0.3
Noise level change (Sunday proposed hours)	0.0	0.1

Table 7 Average ambient noise level change due to children activity at MUGA1 and MUGA2

4.0 CONCLUSION

A noise impact assessment has been undertaken for The Girl's Day School Trust, Northwood, by KP Acoustics Ltd.

Calculations have allowed the degree of acoustic impact upon the existing adjacent residential properties as a result of sports/play on the Multi Use Games Area to be understood.

Current calculation results have shown that noise emissions of the MUGA1 and MUGA2 would be negligible when compared to the ambient noise level.

Use of the MUGA1 and MUGA2 during proposed hours would result in noise received falling in the 'none' effect category defined by IEMA Guidelines for Environmental Noise Impact Assessment.

Northwood, muga2 - Position 1
Environmental Time History
11/11/2022 to 14/11/2022

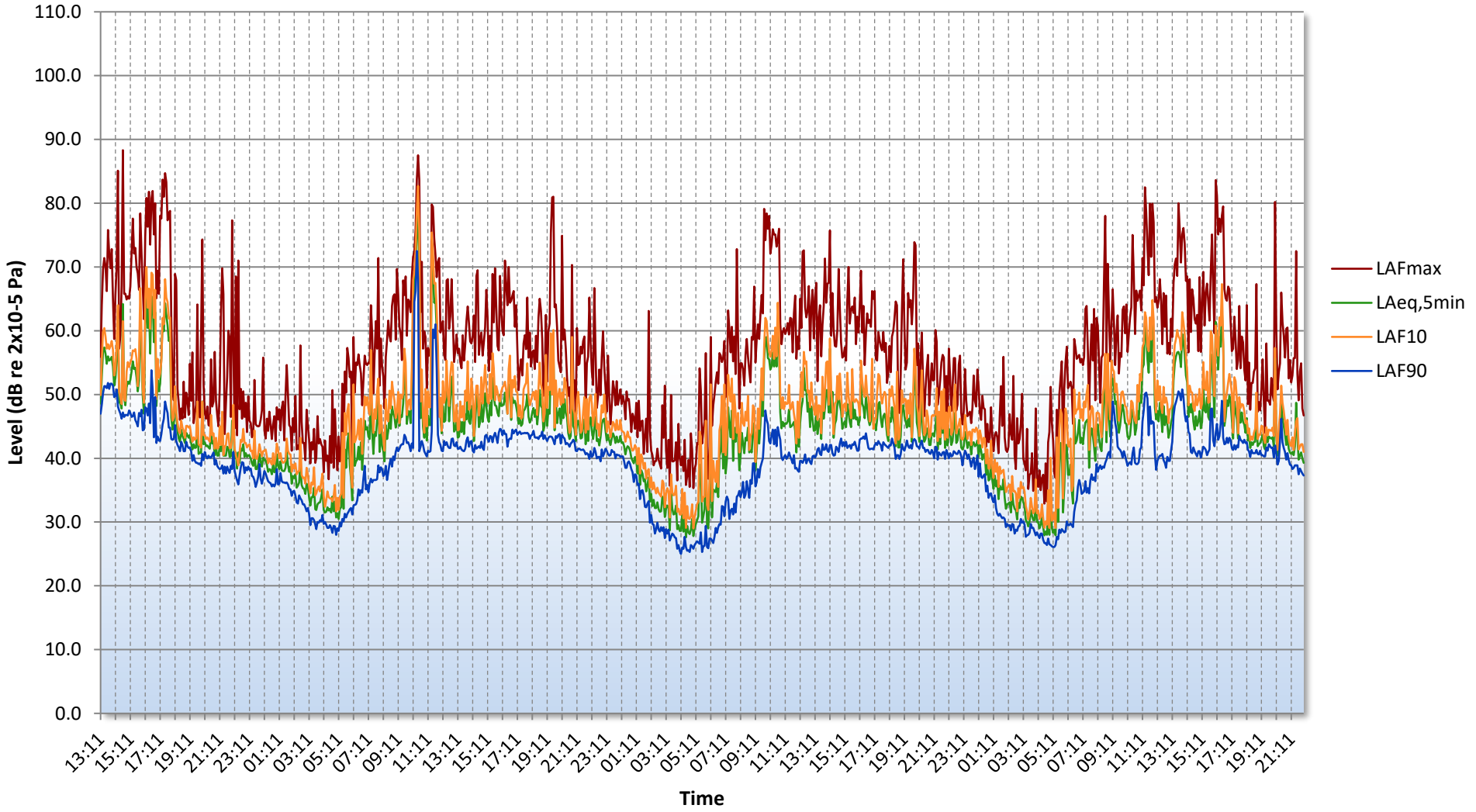

Figure 24405.TH1

Northwood, Front façade, Maxwell Rd. - Position 2
Environmental Time History
11/11/2022 to 14/11/2022

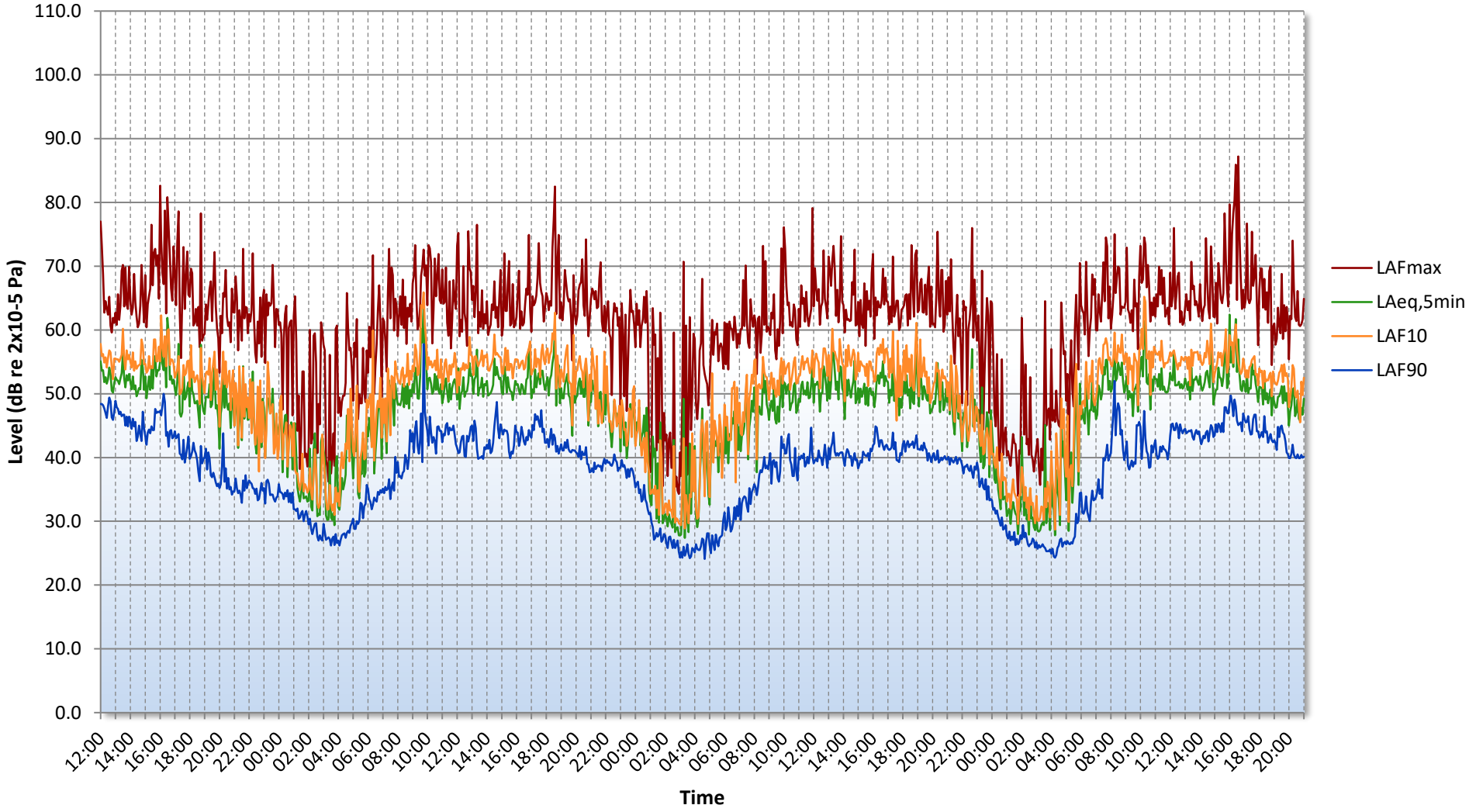

Figure 24405.TH2

APPENDIX A

GENERAL ACOUSTIC TERMINOLOGY

Decibel scale - dB

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

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

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

L_{eq}

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

L_{10}

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

L_{90}

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

L_{max}

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

Octave Bands

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

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

APPENDIX A

APPLIED ACOUSTIC TERMINOLOGY

Addition of noise from several sources

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

Attenuation by distance

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

Subjective impression of noise

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

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

Transmission path(s)

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

Ground-borne vibration

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

Sound insulation - Absorption within porous materials

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

APPENDIX B1

The Girls Day School Trust, Northwood

Outside activity Emissions Calculations

Source: Multi use games area/ outdoor activity at MUGA 2	Frequency, Hz								
Receiver: Front façade residential windows at Myrtleside Cl.	***63***	***125***	***250***	***500***	***1k***	***2k***	***4k***	***8k***	***dB(A)***
Outdoor activities (Sound Pressure Level @1m)	34	49	51	58	60	60	54	42	65
Minimum attenuation provided by distance (40m), dB	-32	-32	-32	-32	-32	-32	-32	-32	
Total Rating Noise Level of all Plant Unit Installations at Receiver	**2**	**17**	**19**	**26**	**28**	**28**	**22**	**10**	**33**

Total received from children activity	**33**
Average Measured Ambient Noise Level (Weekday)	**45**
Combined sound pressure level at receiver	**45.3**
Noise Level Change	**0.3**

Source: Multi use games area/ outdoor activity at MUGA 2	Frequency, Hz								
Receiver: Front façade residential windows at Myrtleside Cl.	***63***	***125***	***250***	***500***	***1k***	***2k***	***4k***	***8k***	***dB(A)***
Outdoor activities (Sound Pressure Level @1m)	34	49	51	58	60	60	54	42	65
Minimum attenuation provided by distance (40m), dB	-32	-32	-32	-32	-32	-32	-32	-32	
Total Rating Noise Level of all Plant Unit Installations at Receiver	**2**	**17**	**19**	**26**	**28**	**28**	**22**	**10**	**33**

Total received from children activity	**33**
Average Measured Ambient Noise Level (Sunday)	**51**
Combined sound pressure level at receiver	**51.1**
Noise Level Change	**0.1**

APPENDIX B2

The Girls Day School Trust, Northwood

Outside activity Emissions Calculations

Source: Multi use games area/ outdoor activity at MUGA 1	Frequency, Hz								
Receiver: Front façade residential windows at Maxwell Rd..	***63***	***125***	***250***	***500***	***1k***	***2k***	***4k***	***8k***	***dB(A)***
Outdoor activities (Sound Pressure Level @1m)	34	49	51	58	60	60	54	42	65
Minimum attenuation provided by distance (90m), dB	-39	-39	-39	-39	-39	-39	-39	-39	
Attenuation provided due to building envelope	-6.7	-8.1	-9.9	-12.2	-14.8	-17.6	-20.5	-23.5	
Total Rating Noise Level of all Plant Unit Installations at Receiver	**-12**	**2**	**2**	**7**	**6**	**3**	**-6**	**-21**	**12**

Total received from children activity	**12**
Average Measured Ambient Noise Level (Weekday)	**49**
Combined sound pressure level at receiver	**49.0**
Noise Level Change	**0.0**

Source: Multi use games area/ outdoor activity at MUGA 1	Frequency, Hz								
Receiver: Front façade residential windows at Maxwell Rd..	***63***	***125***	***250***	***500***	***1k***	***2k***	***4k***	***8k***	***dB(A)***
Outdoor activities (Sound Pressure Level @1m)	34	49	51	58	60	60	54	42	65
Minimum attenuation provided by distance (90m), dB	-39	-39	-39	-39	-39	-39	-39	-39	
Attenuation provided due to building envelope	-6.7	-8.1	-9.9	-12.2	-14.8	-17.6	-20.5	-23.5	
Total Rating Noise Level of all Plant Unit Installations at Receiver	**-12**	**2**	**2**	**7**	**6**	**3**	**-6**	**-21**	**12**

Total received from children activity	**12**
Average Measured Ambient Noise Level (Sunday)	**51**
Combined sound pressure level at receiver	**51.0**
Noise Level Change	**0.0**