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13<sup>th</sup> April 2016

Dear John,

Your reference: Abacus Belsize Primary School - Environmental Noise Impact  
Assessment: Noise Impact assessment from the Play Areas.  
Our reference: PC-14-0368-LT1

Further to the environmental noise survey undertaken by Pace Consult Ltd, and the recently provided drawings, I am pleased to provide findings of our environmental sound level calculations for the play areas located externally at the Abacus Belsize Primary School building.

## 1 Introduction

Pace Consult Ltd completed a background noise survey and documented the findings in the report PC-14-0368-RP1 dated 18th March 2015. The findings have been used to evaluate the noise impact of the roof play areas located externally on the roof and at ground level of the new building.

The expected noise levels from external play areas at the nearest noise sensitive receptors to the Abacus Belsize Primary School were calculated and compared against the lowest measured background noise levels measured on site.

The levels used in the calculations were extracted from the noise database included within the acoustic software SoundPLAN v 7.4. This levels are similar to the levels measured by Pace Consult Ltd in similar locations. To undertake the outdoor sound level calculations Part 2 of ISO 9613 *Acoustics -- Attenuation of sound during propagation outdoors -- Part 2: General method of calculation* was used. This ISO standard is incorporated in the SoundPLAN v 7.4 software. This software was used to generate outdoor sound levels from the Abacus Belsize Primary School building to the nearest noise sensitive receptors and to produce noise contour maps.



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The noise emission from the play areas located within Abacus Belsize Primary School was assessed during the daytime period.

## 2 Criteria – Noise rating level at noise sensitive receptors

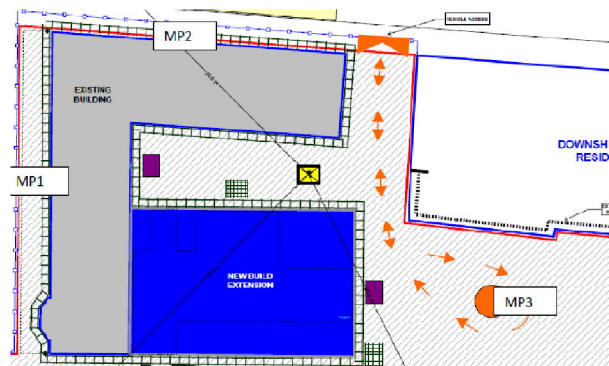
In order to assess the potential noise impact from the play areas on nearby residential properties, the table below shows the scale of significance effect for change in noise level. This table is generated by the Institute of Acoustics/institute of environmental management and assessment working party's draft guidelines for noise impact assessment.

Change in noise level dBA	Scale of effect of significance
≥5.0	Major negative
3.0 to 4.9	Moderate negative
1.0 to 2.9	Minor negative
0 to 0.9	Negligible

Negligible effect occurs when the calculated noise levels from the play areas are not above the measured noise climate affecting the residential area.

The existing noise climate at the nearest residential is included in the table below

ID MP	LAeq dB (Log average)	LA1 dB Average	LA90, 15 min dB Lowest measured
Day (07:00-18:00)	49	58	40
Evening (18:00-23:00)	48	57	34
Night (23:00-07:00)	47	52	31

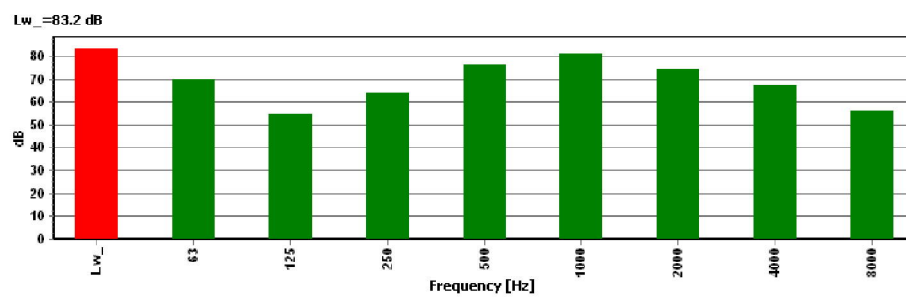


Note. Position MP3 is representative of the noise climate at the nearest noise sensitive receptors.

In order to evaluate the noise emission from the play areas at 1 metre from the façade of the nearest noise sensitive receptors, SoundPLAN v 7.6 was used. The methodology used to evaluate the noise emission is the ISO 9613-2 "Acoustics- Attenuation of sound during propagation outdoors". Although there are different methodologies to calculate the outdoor noise propagation, ISO 9613- 2 is well regarded for the evaluation of outdoor noise propagation.

### 3 Calculation assumptions

In order to evaluate the noise emission from the play areas, the following noise level is used in the calculation.



The noise source used in the calculation equates to raised voices. This provides a good representation of the expected average noise level emissions.

#### 4 Calculation Summary

The table below shows the nearest noise sensitive receptors included in the noise impact assessment.



ID	Calculated Sound Pressure Level
R1	Rosslyn Hill
R2	
R3	

#### 4.1 Play areas noise impact

The calculated sound levels at the nearest noise sensitive receptors based on the information included in section 3 are included in the table below.

The calculation assumes a solid transparent barrier surrounding the play area located on the roof of the extended school.

ID	Floor	Calculated Sound Pressure Level
R1	GF	53
	1 <sup>st</sup>	56
	2 <sup>nd</sup>	56
	3 <sup>rd</sup>	55
R2	GF	51
	1 <sup>st</sup>	52
	2 <sup>nd</sup>	52
R3	GF	47
	1 <sup>st</sup>	51

The table below shows the assessment against the noise climate measured on site during day time. Roof play area only.

ID	Floor	Calculated Sound Pressure Level	Noise climate LAeq dB	Calculated noise levels above noise climate
R1	GF	33	49	-16
	1 <sup>st</sup>	34		-15
	2 <sup>nd</sup>	34		-15
	3 <sup>rd</sup>	35		-14
R2	GF	29		-20
	1 <sup>st</sup>	30		-19
	2 <sup>nd</sup>	30		-19
R3	GF	29		-20
	1 <sup>st</sup>	29		-20

The table below shows the assessment against the noise climate measured on site during day time. Roof and ground level play areas combined.

ID	Floor	Calculated Sound Pressure Level	Noise climate LAeq dB	Calculated noise levels above noise climate
R1	GF	53	49	4
	1 <sup>st</sup>	56		7
	2 <sup>nd</sup>	56		7
	3 <sup>rd</sup>	55		6
R2	GF	51		2
	1 <sup>st</sup>	52		3
	2 <sup>nd</sup>	52		3
R3	GF	47		-2
	1 <sup>st</sup>	51		2

As can be seen from the table above the noise impact significance at nearest receptors are within minor negative and major negative scale. The only receptor where the noise levels are below the measured noise climate is R3 at ground level. The major noise impact at nearest receptors is due to the play area located at ground level. Noise from the play area located on the roof of the new building should have low impact due to the location of a transparent screen as per drawing 114031-P601.

It is not possible to reduce noise transfer from the play area located at ground level to the nearest residential properties without the inclusion of costly measures (design of an acoustic barrier at least 4.5 metres surrounding this play area).

The calculated noise level at R1 is 1 dB above (negligible effect), which is within the range recommended by the World Health Organization ( $\leq$  LAeq dB 55) to prevent serious annoyance during day time.

Although noise from this area will be audible at the nearest residential properties, the space will only be used during the school day, and will only be used as a play area during the mid-morning and early afternoon periods; this should help to minimise the impact on residents.

The figure below shows the acoustic map of the study area.



## **5. Conclusions and Discussion**

The calculated noise emission from the play areas within the Abacus Belsize Primary School show that the average noise levels from the play area located on the roof of the new building should be below the noise climate affecting the nearest residential. However, the noise levels from the play area located at ground level are expected to be above the existing noise climate affecting the nearest residential but equal or below the levels recommended by the WHO to prevent serious annoyance during day time.

Yours sincerely,

For Pace Consult



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