

King's House School

Play area noise assessment

King's House School

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Principal author
Jason Gallimore
Signed by: j.gallimore@cundall.com

X

Checked by
Victor Lindstrom
Signed by: Lindstrom, Victor

X

Verified by
Matthew Hyden
Signed by: j.gallimore@cundall.com

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1.0 Introduction

Cundall has been appointed by King's House School to assess potential noise impacts, at existing residential properties, of the proposed change to the play area provision as part of the proposed redevelopment of the school.

This report describes the assessment process, any assumptions made and the results of the assessment.

Cundall has previously been commissioned by King's House School to carry out an environmental noise assessment for the proposed works at the school on Kings Road, Richmond. Noise from building services plant and for noise break out from the new music department was previously assessed

2.0 Assessment criteria

2.1 Sport England Guidance

Sport England provides guidance on noise from sports pitches and states the following:

“Based on a 15-decibel sound reduction of a partially open window, the noise level outside a residential property during the daytime about 1 metre from façades of living spaces should not exceed 50 dB LAeq. The WHO document also provides guidance for outdoor living areas. It states that to avoid ‘moderate annoyance’ during the daytime and evening the noise level should not exceed 50 dB LAeq(T).”

Based on the above, Where play area noise levels at sensitive receptors associated with the proposed scheme are below 50 dB LAeq,T, it is considered unlikely that significant adverse effects will occur.

2.2 IEMA Guidelines

In addition to absolute levels of noise, this assessment will also quantify the potential impact as a result of change in noise levels at relevant noise sensitive receptors. Based on information and guidance provided in the IEMA Guidelines for Environmental Noise Impact Assessment document, the following table summarises how the impact of changes in noise level will be evaluated:

Sound Awareness	Change in noise level, ΔL (dB)
No change	$\Delta L = 0$
Negligible increase (unlikely to be perceptible)	$\Delta L < 1$
Perceptible increase and potential minor impact	$1 \leq \Delta L < 3$
Moderate increase	$3 \leq \Delta L < 5$
Major increase	$\Delta L \geq 5$

Table 1 – Magnitude of impact from change in noise level

It is important to note that impacts as a result of change in noise level should not be considered in isolation and should also take account of:

- The absolute level of noise (see above);
- The context of the noise; and
- The existing ambient / background noise from other sources

3.0 Proposed scheme

The play areas of King's House school are subject to change as part of the proposed redevelopment works, it is understood that the residents of nearby Charmouth Court have voiced concern regarding a potential increase in noise level from the proposed changes.

The existing and proposed play areas are shown in magenta on Figure 1 and Figure 2 below.



Figure 1 – Extent of existing play areas



Figure 2 – Extent of Proposed play areas

3.1 Noise sensitive receptors and existing acoustic conditions

The proposed site and noise sensitive receptors on Charmouth Court are shown in Figure 3 below. The facades highlighted in yellow relate to the facades that have been considered as part of this assessment.

The dominant noise sources affecting the site were noted as:

- the play area, when in use,
- air traffic noise.
 - The site is underneath a flight path, aeroplanes were noted as flying overhead every 2 to 3 minutes.
- road traffic noise was also noted as being audible but not dominant.



Figure 3 - Site boundary and NSRs

The existing noise climate at these receptors has been measured as part of the previous noise assessments for the development. This is covered in more detail in report ref. 1018236-RPT-AS-001 and summarised below:



Figure 4 - approximate noise measuring positions

The following tables summarise the noise levels measured by Cundall.

Date	Average Ambient Noise Level, $L_{Aeq,T}$ (dB)		Typical Background Noise Level during School Hours, $L_{A90,5min}$ (dB)
	Daytime (T = 16hrs)	School Hours (T = 11 hrs)	
Tues 11 Sept	51	53	44
Wed 12 Sept	58	59	43
Thur 13 Sept	59	60	41
Fri 14 Sept	59	61	42
Sat 15 Sept	57	58	-
Sun 16 Sept	57	58	-
Mon 17 Sept	59	59	46

Note: Daytime: 07:00 – 23:00 hrs where period, T = 16 hours, School Hours (worst case including after school activities): 08:00 – 19:00 hrs where time period, T = 11 hours, unless otherwise stated.

* Due to measurement start / end time, full day measurements were not undertaken on Tues 11 and Mon 17 September. As such, period T is different for these days: Daytime T = 8 hrs and School Hours T = 4 hrs on the 11th and Daytime T = 10 hrs and School Hours T = 9 hrs on the 17th

Table 2 – CU1 Unattended Noise Measurement Results

Start Time	Duration	Average Ambient Noise Level, $L_{Aeq,30min}$ (dB)	Typical Background Noise Level, $L_{A90,5min}$ (dB)
17:15	1 hour & 10 mins	57	42

Table 3 – CA1 Attended Noise Measurement Results

The below table summarises the noise levels measured by Sharps Gayler.

Date	Average Ambient Noise Level (School Hours), $L_{Aeq,11hr}$ (dB)	Minimum Background Noise Level, $L_{A90,5min}$ (dB)
Fri 22 Feb	55	38
Tues 26 Feb	50	43
Wed 27 Feb	57	43
Thur 28 Feb	64	45
Fri 01 Mar	58	46
Mon 04 Mar	56	46
Tue 05 Mar	55	43
Wed 06 Mar	55	46
Tue 02 Apr	57	50
Mon 20 May	57	41
Tue 21 May	57	42
Wed 22 May	56	43
Thur 23 May	65	42

Note:

Following data has been removed from the data above: Weekends, any days where a full day's data has not been collected, corrupt data.

Table 4 – SU1 Unattended Noise Measurement Results Summary - Sharps Gayler

4.0 Noise assessment

4.1 Assessment of noise level change

An assessment has been undertaken to calculate the difference in noise levels at the facades of the receptors on Charmouth Court based on the existing and proposed scenarios. The assessment has been based on the following assumptions:

- Noise level of the play areas based on Sport England guidance that a sports pitch has a noise level of **58 dBA at 10 metres** from the halfway line.
 - This corresponds to a sound power level for the play areas of **68.7 dB/m²**
 - This has been used for all play areas indicated in magenta in both the existing and proposed scenarios
 - This assumes that noise from play areas is evenly spread across the entire magenta area.
- Noise model assumes that all play areas are used at the same time.
- Dimensions taken from following drawings:
 - KHS-DMA-XX-GF-DR-A-02102 rev P2 – SITE BLOCK PLAN - EXISTING
 - KHS-DMA-XX-GF-DR-A-02103 rev P5 – SITE BLOCK PLAN – PROPOSED
- Massing of the existing and proposed school site has been simplified for the purposes of the prediction model; this will not significantly affect the results of the modelling.

The assessment was carried out using the commercially available SoundPLAN v 8.2 noise modelling software. Noise levels for the existing and proposed play area scenarios have been predicted and façade noise maps have been produced using the results of the assessments.

The following image shows the difference in play area noise levels at the residential properties on Charmouth Court between the existing play area scenario and the proposed scheme play area layout.

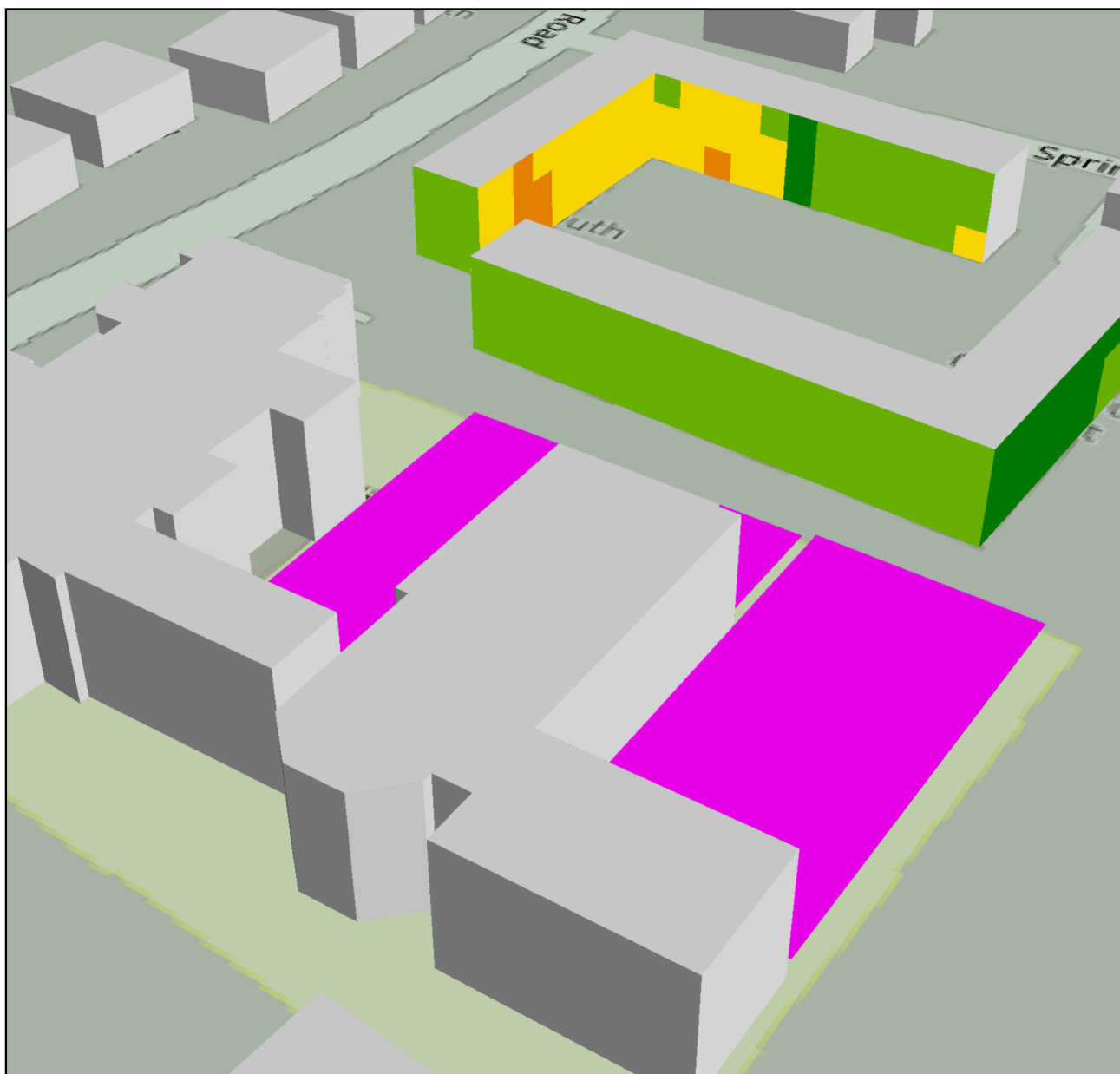


Figure 5 - Difference in facade noise levels

The following table can be used to interpret Figure 5

Change in noise level, ΔL (dB)	Colour on Graphic	Impact classification
-1	Dark Green	Negligible impact (beneficial, unlikely to be perceptible)
0	Light Green	No impact
< 1	Yellow	Negligible impact (unlikely to be perceptible)
< 3	Orange	Minor impact
< 5	Red	Major impact

Figure 6 – Predicted noise change

It is important to note that these changes in noise level are for play area noise only and do not take account of existing ambient noise levels from other sources (i.e. road traffic and overflying aircraft). This is discussed separately.

The findings of this prediction exercise are summarised as follows:

- All facades directly facing the school are subject to increases in noise level of no more than 1 dB. Therefore, impacts are considered to be negligible and are unlikely to be perceptible.
- A small section of the facades facing the internal courtyard are predicted to be subject to a minor increase in noise levels. This level of change is likely to be just perceptible in isolation but needs to be considered in the context of the absolute level of sound and the existing ambient noise climate.
- In some areas a slight reduction in noise level has been predicted.

It is important to note that this assessment is based on a predicted change in noise level and does not consider the absolute noise levels or the existing noise climate.

It is likely that the areas of the facades where an increase in noise level has been predicted are below existing ambient noise levels and are therefore unlikely to be audible above the existing noise. This is discussed in the following section.

4.2 Assessment of absolute noise level

The noise predictions have also been used to undertake an assessment of absolute noise levels from the proposed play areas at the facades of the receptors on Charmouth Court. This assessment does not consider any other noise source (e.g. road, plant, aircraft). It is understood that the actual noise levels at the site are dominated by aircraft and distant road traffic noise.

As discussed in the preceding section, in the majority of locations assessed the increase in noise from the proposed play area changes have been found to be negligible and are unlikely to result in adverse impacts.

The assessment of absolute noise levels will focus on the locations in Charmouth Court where changes in noise levels of greater than 1 dB have been predicted.

Figure 7 shows the results of the noise prediction at the facades of Charmouth Court. Noise levels are shown on the Key inset. It is important to note that these noise levels are based on the assumption that all play areas are being used simultaneously and therefore represents a worst-case scenario.

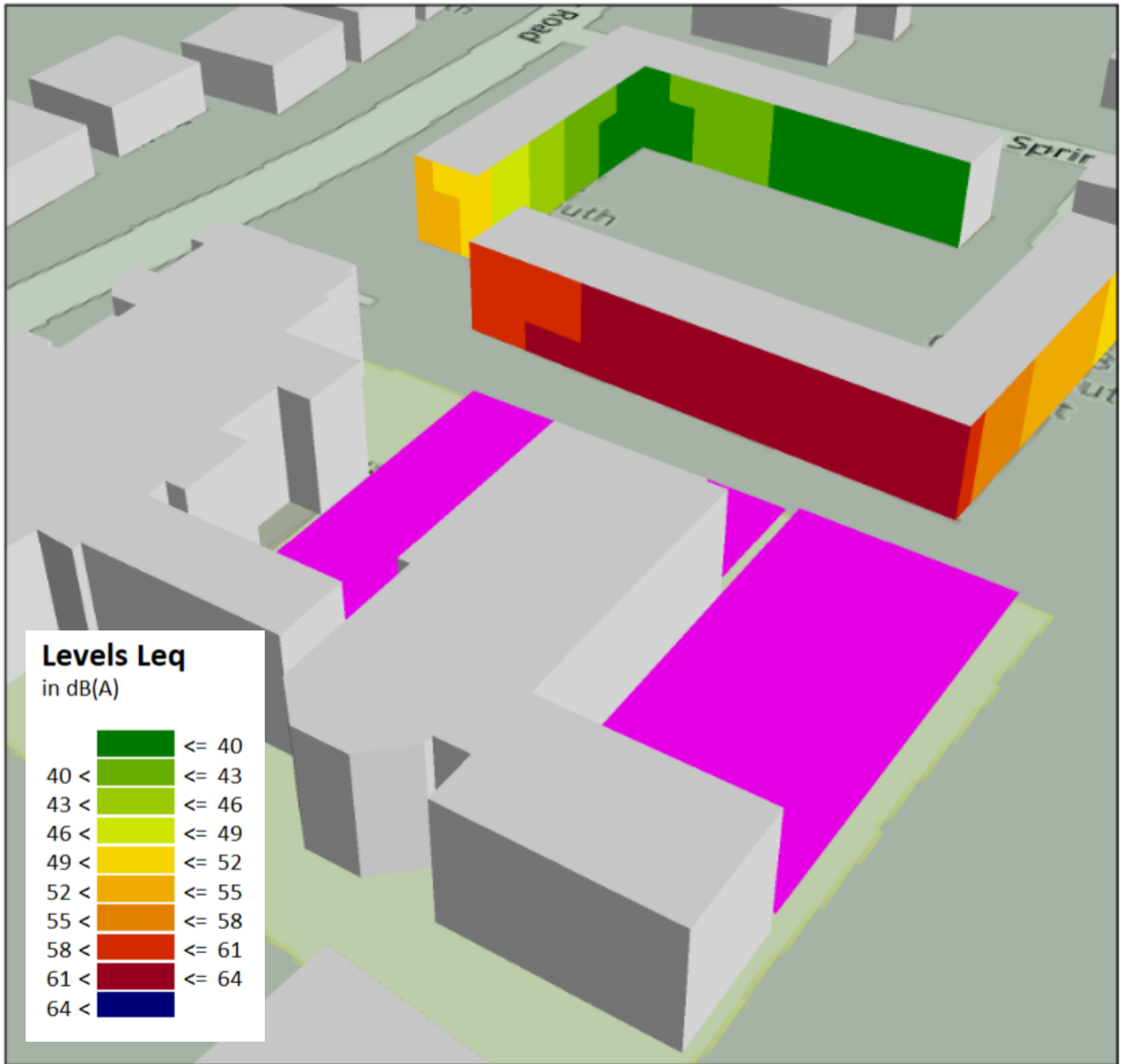


Figure 7 - Predicted absolute noise levels at Charmouth Court

The modelling shows that at the Charmouth Court facades where changes in play area noise of greater than 1 dB have been identified, absolute noise level of between 40 and 49 dB $L_{Aeq,T}$ have been predicted.

As previously stated, the Sport England guidance suggests that : *'the noise level outside a residential property during the daytime about 1 metre from façades of living spaces should not exceed 50 dB L_{Aeq} '*

It can therefore be seen that in the limited areas of Charmouth Court where perceptible increases in play ground noise occur they are likely to be below the recommended levels in the Sport England guidance (and the WHO guideline value for 'moderate annoyance').

Furthermore, the noise levels measured close to the façade of Charmouth Court (ref: Table 3) are 57 dBA $L_{Aeq,1hour}$.

These noise levels are likely to be representative of existing ambient noise levels at the facades under discussion given that the dominant noise source is air traffic noise which will not be screened by other buildings.

Considering existing ambient noise level of 57 dB $L_{Aeq,1hour}$, predicted absolute noise levels of 40 – 49 dB $L_{Aeq,1hour}$ from the play areas are unlikely to result in adverse impacts at the residential properties.

5.0 Conclusion

A noise impact assessment of the proposed changes to play areas has been undertaken in terms of noise change and absolute levels at the nearby Charmouth Court residential properties. The assessment has found the following:

- For the majority of residential facades, including façades that are closest to the play areas, it has been predicted that noise impacts are likely to be negligible. In these locations noise levels are predicted to increase by no more than 1 dB and this level of change is unlikely to be perceptible to residents.
- In some areas a slight decrease in noise has been identified.
- At a small number of façades, a minor adverse impact, when assessed in terms of noise change has been identified. However, absolute noise levels in these areas are below the maximum noise criterion proposed by Sport England guideline of 50 dB $L_{Aeq,T}$. In addition, noise from the play areas in these locations is also likely to be significantly less than the existing ambient noise climate at Charmouth Court.

Based on the above, it is considered that adverse noise impacts as a result of the proposed play area layout changes at King's House School are unlikely to occur at the residential properties on Charmouth Court.

These findings are not unexpected, as the proposed layout changes are relatively minor from an acoustic perspective as the play areas have not significantly increased in size or moved closer to the receptors.

Cundall Johnston & Partners LLP

One Carter Lane London EC4V 5ER
United Kingdom Tel:+44 (0)20 7438 1600

Asia Australia Europe MENA UK and Ireland
www.cundall.com

