

King's House School

Noise Report

King's House School

Job No: 1018236
Doc Ref: 1018236-RPT-AS-001
Revision: P05
Revision Date: 10 February 2021

Project title	King's House School	Job Number
Report title	Noise Report	1018236

Document Revision History

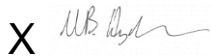
Revision Ref	Issue Date	Purpose of issue / description of revision
P01	11 April 2019	For Planning
P02	18 December 2019	Update following building layout change
P03	07 January 2020	Update following comments
P04	08 January 2021	Update for planning resubmission
P05	11 February 2021	Update following planner comments

Document Validation (latest issue)



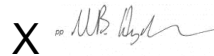
Principal author: Momo Hoshijima

Signed by: j.gallimore@cundall.com



Checked by: Matthew Hyden

Signed by: m.hyden@cundall.com



Verified by: Adam Cooke

Signed by: m.hyden@cundall.com

Executive Summary

Baseline noise surveys have been carried out and an environmental noise assessment has been undertaken as part of a planning application for the proposed extension building for King's House School.

Assessment of noise has been undertaken following the assessment procedure set out by the London Borough of Richmond upon Thames (LBRuT).

A plant noise limit has been identified as part of the assessment based on the measured background noise levels and the requirements of the Local Authority. To achieve 'minimal' significance risk (ref. LBRuT guidance) at nearby noise sensitive receptors, overall noise emission levels should not exceed the limit summarised in the table below.

Period	Typical background noise level, $L_{A90,15min}$ (dB)	Plant noise limit at 1 m from NSR façade, $L_{A,15min}$ (dB)
Daytime (07:00 – 23:00 hrs)	41	36

Limits for music noise breaking out of the proposed extension building have also been set out based on the measured background noise levels and the requirements of the Local Authority, as summarised below.

Period	Most Commonly Occurring Background Noise Level, $L_{A90,5min}$ (dB)	Music Noise Criteria	
		At 1 m from nearest NSR	Inside nearest NSR
School Hours (08:00 – 19:00 hrs)	42	≤ 42 dB $L_{Aeq,5min}$	\leq NR 25

If the noise limits and advice outlined in this report are complied with, it is considered that the proposed development will meet the planning noise requirements of LBRuT. In addition, the development would be considered unlikely to result in a significant adverse impacts on sensitive receptors as a result of noise.

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1.0 Introduction

Cundall has 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.

The purpose of this report is as follows:

- To identify relevant Local Authority planning criteria (London Borough of Richmond upon Thames);
- To document existing noise levels at the site and at a location representative of the nearest noise sensitive receptor; and
- To suggest appropriate noise limits for externally mounted building services plant and for noise break out from the new music department.

2.0 Site description

2.1 Proposed development

The proposed development includes demolition of a number of existing school buildings and the erection of a two and three storey new build teaching block, linking to the existing sports hall, which will be extended to the north. This new teaching facility consists of music and drama classrooms, music practice rooms and general teaching classrooms. There are associated areas for staff, storage and services, which support the running of the building

Site location and prevailing noise climate

The school is located at 68 Kings Road, Richmond in a predominantly residential area. The school site is bounded by Kings Road to the west and surrounded by residential properties to the north, east and south.

The dominant noise source affecting the site is aircraft flyover to and from Heathrow airport. Traffic noise from Kings Road also contributed to the ambient noise climate but is not considered the dominant source.

2.2 Noise sensitive receptors

The nearest noise sensitive receptors (NSRs) to the proposed extension are the residential buildings to the south. The nearest residential premise sits directly adjacent to the school boundary. An indicative site boundary is shown in red on the plan below with the nearest NSR location outlined in yellow.



Figure 1 - Map showing approximate site boundary (red) and nearest NSR (yellow)

3.0 Assessment criteria

This section outlines the key legislation and guidance relevant to the assessment of noise for a development of this type.

3.1 Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) was published by Defra in March 2010. The NPSE sets out the long-term vision of Government noise policy:

“Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.”

The NPSE long term vision is supported by the following aims:

“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.”*

3.2 National Planning Policy Framework

The revised National Planning Policy Framework was updated on 19 February 2019 and sets out the government’s planning policies for England and how these are expected to be applied.

This revised Framework replaces the previous National Planning Policy Framework published in March 2012 and revised in July 2018.

The NPPF states:

“130. Permission should be refused for development of poor design that fails to take the opportunities available for improving the character and quality of an area and the way it functions, taking into account any local design standards or style guides in plans or supplementary planning documents. Conversely, where the design of a development accords with clear expectations in plan policies, design should not be used by the decision-maker as a valid reason to object to development. Local planning authorities should also seek to ensure that the quality of approved development is not materially diminished between permission and completion, as a result of changes being made to the permitted scheme (for example through changes to approved details such as the materials used).

170. Planning policies and decisions should contribute to and enhance the natural and local environment by;

[...]

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;

180. 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:

a) 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;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; [...]

182. *Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."*

3.3 BS 4142: 2014 'Methods for rating and assessing industrial and commercial sound'

BS 4142 provides a methodology for assessing the impacts arising at sensitive receptors from sound of an industrial and/or commercial nature. A formal BS 4142 impact assessment has not been carried out in this report; however, the principles of the standard have been used to determine appropriate plant noise limits.

3.4 BB93 - Acoustic design of schools: performance standards

Building Bulletin 93 ¹(BB93) sets out minimum performance standards for acoustics in school buildings and describes the normal means of compliance with the Building Regulations.

3.4.1 Supplementary Planning Document (SPD)

Development Control for Noise Generating and Noise Sensitive Development adopted in September 2018 outlines specific noise policies of the London Borough of Richmond upon Thames (LBRuT). The policies are intended to protect sensitive properties from excessive noise levels and to identify issues to be addressed in any application for development in which noise and/or vibration will be an important consideration.

3.4.1.1 Noise sensitive development

LBRuT's SPD identifies a preferred five-stage noise assessment process for noise sensitive development which includes educational establishments, as summarised below.

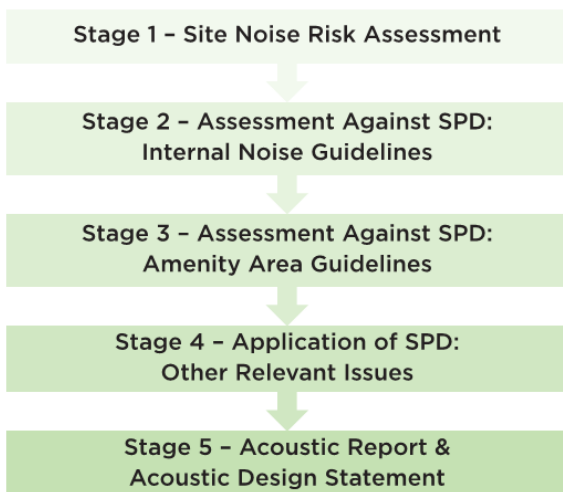


Figure 2 - Noise Sensitive Development - Noise Assessment Process

¹ Building Bulletin 93 (BB93) Acoustic Design of Schools issued February 2017

Stage 1 of the assessment process requires that the ambient noise levels around the site are established to identify the noise significance risk for the site and to determine the site's suitability of use based on the risk level following the below principles².

Noise Significance Risk	Noise Significance (without mitigation)	Indicative Noise Levels	Pre-Planning Application Advice
Negligible	No adverse noise effect	L _{Aeq} , 16hr <50dB L _{Aeq} , 8hr < 40dB	Low noise levels indicate that the development site is likely to be acceptable from a noise perspective.
Low	 	 	Noise levels in this region mean that the development site is likely to be acceptable from a noise perspective, provided that good acoustic design is followed and demonstrated in an Acoustic Design Statement which confirms how the adverse impacts of noise will be mitigated and minimised in the completed development.
			As noise levels increase, the site is less likely to be suitable for development from a noise perspective and planning consent is more likely to be refused unless a good acoustic design process is demonstrated in a detailed Acoustic Design Statement which confirms how adverse noise impacts will be mitigated and minimised, and which clearly demonstrates that any significant adverse noise impacts will be avoided in the completed development.
Medium	Increasing risk of adverse effect 	 	L _{Aeq} , 16hr 63-69dB L _{Aeq} , 8hr 55-60dB
			High noise levels indicate that there is an increased risk that development may be refused on noise grounds.
High			The risk of refusal may be reduced by following a good acoustic design process. Applicants are strongly advised to seek expert advice and discuss the proposals in advance with the Local Authority.

Figure 3 - SPD Stage 1 Initial Noise Risk Assessment

Stage 2 of the assessment process relates to the internal design noise levels and the acoustic performance required of the building envelope to achieve these internal noise levels. For the assessment for the proposed school building, internal design noise levels have been based on the requirements of Building Bulletin 93 ³(BB93).

Stage 3 of the assessment process sets out the requirement for the noise levels in external amenity spaces to ideally not exceed a range of 50 – 55 dB L_{Aeq,16hr} (for more information regarding external noise levels please see Section 5.3.).

Stage 4 of the assessment process relates to other factors that influence whether noise could be a concern which may include, but are not limited to:

- the source and absolute level of the noise;
- the time of day noise occurs;
- the number, frequency and pattern of noise levels;
- the spectral content of the noise;
- character of the noise;
- possible cumulative impacts from several sources; and
- local topology and topography.

² The values in the Figure 3 below appear to be based on the ProPG document that covers planning guidance for residential purposes. However, as internal guideline noise levels for typical classrooms are similar to those for residential developments during the day the assessment is still considered to be useful.

³ Building Bulletin 93 (BB93) Acoustic Design of Schools issued February 2017

The last stage of the assessment process outlines the requirement for an acoustic report and acoustic design statement. These documents should include design consideration of noise sensitive development and are not limited to residential use only i.e. other types of noise sensitive use may need to be considered. For educational establishments, reference to BB93 is advised and noise generated by specific school activities are to be assessed on case by case basis.

3.4.1.2 External plant noise

The SPD also outlines noise rating levels in accordance with the guidance provided in BS4142:2014 and noise significance risk levels. To demonstrate that the noise significance risk is kept to a 'minimal' as defined by the LBRuT, the rating level of noise ($L_{Ar,Tr}$) from external items of plant should be at least 5 dB below the background noise level, when assessed at the nearest NSR.

3.4.2 Music Noise

Following the pre-application request, a letter from LBRuT was received in which requirements for noise from music sources have been outlined which are applicable to the proposed development.

Noise from music sources is referred to as the Entertainment Noise level (EN). The Entertainment Noise level (expressed in terms of $L_{Aeq,5min}$ and NR^4) should be measured or predicted at 1 meter from the façade of, or internally within, the closest NSR.

The equivalent continuous sound level ($L_{Aeq,T}$) from music noise emanating from the school shall not exceed the following limits at the nearest Noise Sensitive Receptor:

Time Period	Music Noise Criteria, $L_{Aeq,5min}$	
	At 1 m from nearest NSR façade	Inside nearest NSR, assuming open windows
Day / Evening	EN in $L_{Aeq,5min}$ should be no greater than the existing background noise level $L_{A90,T}$ *	$\leq NR 25$
Note: *for assessment purposes, the background noise level is assumed to be the most commonly occurring value of the twelve 5-minute measurements during the last hour of the operation of the premises (i.e. school hours).		

Table 1 - LBRuT Music Noise Criteria

⁴ Noise Rating.

4.0 Baseline noise survey

This section of the report details the environmental noise survey that has been undertaken for the proposed extension for King's House School.

Cundall has undertaken a baseline noise survey comprising attended measurements and unattended logging between 11 and 17 September 2018. The measurement locations were focused more on the northern side of the school site where the new extension building was originally proposed.

An additional survey has been carried out to the south of the school site by Sharps Gayler. The results from this survey are considered more representative of the noise climate at the nearest NSR based on the revised building footprint.

The following sections detail the surveys undertaken for the school.

4.1 Measurement conditions

Cundall undertook a combination of attended and unattended baseline noise surveys at the existing school premises.

- Unattended noise logging equipment was left on the roof of the existing King's House School building at the centre of the site between 11 September and 17 September 2018; and
- Attended noise measurements were undertaken at the northern boundary of the site in a position considered representative of the nearest NSR (Charmouth Court) on 17 September 2018.

Sharps Gayler has undertaken an unattended baseline noise survey at the nearest NSR.

- Unattended noise measurements were undertaken in the garden of the nearest residential premises to the southern boundary of the school. These were undertaken from 14 February to 04 March, from 01 to 03 April and 17 to 24 May 2019.

The noise measurement positions are indicated on the map below.



Figure 4 - Map showing approximate noise measurement positions

Weather conditions for the duration of the Cundall surveys were considered suitable for the purpose of the baseline noise monitoring.

4.2 Survey equipment

Table 2 provides relevant details of the equipment used by Cundall for the environmental noise survey. The sound level meter used conforms to BS EN 60651 type 1 accuracy and was field-calibrated before and after survey.

Equipment	Used for	Manufacturer & Model	Serial number	Calibration date
Sound level meter	Attended measurements	Norsonic type 140	1405754	10/12/2015
	Unattended measurements	01dB Fusion	10956	30/11/2015

Table 2 - Noise Measurements Equipment

4.3 Survey results

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 time 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, time 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 3 - 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 4 - 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
<p>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.</p>		

Table 5 - Unattended Noise Measurement Results Summary - Sharps Gayler

4.4 Uncertainty

There is some inherent uncertainty associated with the results of any noise survey. However, the measurement locations chosen by Cundall were considered to be representative of the conditions at the proposed development and nearest noise sensitive receptor. Any unfavourable weather conditions during the survey period are unlikely to have affected the determination of the lowest noise level.

It is therefore considered that the uncertainty associated with these measurements is appropriate to inform the noise impact assessment detailed in this report.

Any information relating to the surveys undertaken by Sharps Gayler provided above is based on the information made available to Cundall. Whilst due care has been taken to provide an accurate reflection of the information provided, Cundall cannot take responsibility for the information provided to Cundall by Sharps Gayler.

5.0 Noise Sensitive Development Assessment

This section of the report relates to assessment of noise following the assessment process outlined in the SPD document.

Outline requirements of this process in relation to the proposed school building are summarised in Section 3.4.1 of this report.

5.1 Stage 1 – Site Noise Risk Assessment

As summarised in Section 4.3, the daytime ambient noise levels at the proposed site typically fall between 58 - 59 dB $L_{Aeq,16hr}$ which is within the 'low' noise significance risk category.

Any adverse noise impacts should be mitigated and minimised in the completed development by good acoustic design, following the principles of BB93 to achieve the indoor ambient noise level criteria for each proposed internal educational space.

The assessment of night-time or weekend noise levels has been excluded as the proposed school building will not be in operation during these periods.

5.2 Stage 2 – Internal Design Noise Levels

Indoor ambient noise level criteria are set out for each new internal space in accordance with the guidance provided in BB93.

Room	Maximum indoor ambient noise level criteria, $L_{Aeq,T}$ (dB)
Classroom	$\leq 35^*$
Drama Studio, Hall, Music room	≤ 35
Recording Studio, Ensemble	≤ 30
Office**	≤ 40
Circulation**	≤ 45
Changing room, Toilets**	≤ 50
* Room subject to 5 dB relaxation for incorporating natural ventilation in accordance with BB93.	
** Criteria for ancillary spaces are provided for guidance only.	

Table 6 - BB93 Indoor Ambient Noise Level Criteria

With the aim of achieving the above indoor ambient noise level (IANL) criteria, the following advice is provided based on the measured external noise levels:

- Airborne sound insulation performance requirements for the building envelope have been calculated and can be achieved by using appropriate glazing and façade solutions;
- All music and drama spaces should be mechanically ventilated; and
- Other teaching spaces may be able to be naturally ventilated through appropriately attenuated ventilators or alternatively could be mechanically ventilated. Teaching spaces cannot be naturally ventilated through standard open windows without exceeding the minimum IANL criteria as outlined in Table 6 above.

The following ventilation strategy is proposed for the internal spaces at the new extension building:

- All music and drama spaces are to be fully mechanically ventilated; and
- Natural ventilation is proposed for all other spaces including the Classrooms and the Main Hall based on the School's request.

As the proposed natural ventilation strategy will be likely to result in BB93 IANL criteria being exceeded in Classrooms and the Main Hall, alternative performances should be agreed with the Building Control.

IANLs within school buildings are controlled under the Building Regulations, it will therefore be necessary to demonstrate compliance with BB93 (or agreed alternative performance standards) to achieve Building Control approval.

5.3 Stage 3 – Design Noise Levels for External Amenity Spaces

This stage of the assessment process is not considered applicable as the proposed school extension building does not include for any new external amenity spaces.

5.4 Stage 4 – Assessment of Other Relevant Issues

The proposed extension building will operate as part of the existing King's House Primary School and will therefore typically operate during the normal school hours between 08:00 and 15:00 and no extra curriculum activities will take place during the night (23:00 – 07:00 hrs).

The main new sources of noise likely to be generated from the proposed development are:

- Externally mounted building services plant
- Noise break-out from music spaces within the proposed extension building

Noise from the above sources may contain 'acoustic characteristics' and music noise in particular will need to be assessed in detail based on spectral content.

Activities associated with the generation of noise as above will normally be limited to typical school hours but may on occasions extend into late afternoon / evening (not night-time).

Any potential noise impact from the above sources will need to be mitigated by design to achieve suitable noise emission limits at the nearest NSR. Details of the assessments of noise from above sources are included in Sections 6.0 and 7.0 respectively.

5.5 Stage 5 – Acoustic Report & Acoustic Design Statement

This report details the assessment process of noise relevant to the proposed extension to the King's House School.

In particular, the report sets out noise limits to reduce impacts at the neighbouring noise sensitive receptors from the following sources:

- Externally mounted building services plant
- Noise break-out from music spaces within the proposed extension building

The design of the proposed extension has been developed in accordance with the guidance provided in BB93⁵ (this is the normal method of demonstrating compliance with the Building Regulations) with specific reference to the following acoustic performance requirements:

- Indoor ambient noise levels
- Airborne and impact sound insulation
- Reverberation control
- Internal building services noise control

Therefore, appropriate acoustic conditions should be achieved within the proposed development.

⁵ With the exception of the IANLs in Classrooms and Main Hall which are expected to exceed the BB93 criteria due to the School's preference to naturally ventilate these spaces. APSs will need to be raised and agreed with the Building Control.

6.0 Plant Noise Limits

As defined by the LBRuT's SPD, the rating level of noise ($L_{Ar,Tr}$) from external items of plant should be at least 5 dB below the background noise level, when assessed at the nearest NSR.

Based on the noise survey data, to satisfy the planning requirements of LBRuT and to achieve the 'minimal' noise significance risk, the level of noise produced by any new items of building services plant must not exceed the noise level limits set out in Table 7 below.

Period	Typical background noise level, $L_{A90,15min}$ (dB)	Plant noise limit at 1 m from NSR façade, $L_{Ar,Tr}$ (dB)
Daytime (07:00 – 23:00 hrs)	41	36

Table 7 - Plant noise emission limits

The above limits refer to the BS4142 rating level ($L_{Ar,Tr}$) of all plant sound sources operating simultaneously at their normal design duty when assessed at 1 m from the façade of the nearest NSR. The rating level of the plant sources includes any relevant 'character corrections' (with reference to BS 4142: 2014) to account for acoustic features which can increase the significance of the impact of the sound source e.g. tonality, impulsivity, intermittency etc.

At this point in the design process, the detailed specifications for building services installations associated with the proposed development are not finalised. However suitable mitigation measures should be specified as necessary (e.g. screening or acoustic attenuators) in order to comply with the above noise emissions limits and to minimise any adverse impacts at the nearest noise sensitive receptors.

7.0 Music Noise Limits

The level of music noise breaking out from the proposed extension building should be limited to protect the nearest NSR and to satisfy the planning requirements of LBRuT.

Based on the survey data and the requirements of LBRuT, the level of music noise should not exceed the noise limits set out in Table 8 below.

Time Period	Most Commonly Occurring Background Noise Level, $L_{A90,5min}$ (dB)	Music Noise Criteria	
		At 1 m from nearest NSR façade	Inside nearest NSR
School Hours (08:00 – 19:00 hrs)	42	≤ 42 dB $L_{Aeq,5min}$	\leq NR 25

Table 8 - Music Noise Criteria

The proposed school building façade should be designed such that the above noise limits are not exceeded. This may require more robust glazing, than that required to control IANLS, in spaces where high levels of music noise will be generated.

Initial calculations have been carried out to predict the level of acoustic performance required by glazing in the new music classrooms and practice spaces. These calculations are based on the following key assumptions:

- The following source noise levels have been assumed to be generated inside the music rooms.

Noise Source	Centre Octave Band Frequency, Hz								Overall dB(A)
	Reverberant Noise Level, $L_{eq,T}$ (dB)								
	63	125	250	500	1k	2k	4k	8k	
Live drummer in a small music practice room (field measured)	84	87	88	89	85	82	84	81	91

Table 9 - Music noise source levels

- The minimum (shortest) distance between the façade of the new music rooms and the nearest NSR has been measured to be 10.3 m.
- No barrier has been assumed to exist between the new extension and the nearest NSR when assessing the music noise impact
- Assessment has been undertaken assuming all 4 rooms that face the NSR being used continuously and simultaneously (please note that this is a worst case assessment and is considered an unlikely scenario)
- All music spaces are assumed to be fully mechanically ventilated as proposed.
- The non-glazed portions of the façade will achieve at least 53 dB R_w
- Dimensions of the glazed elements are based on the proposed design and are summarised below for information.

Room	Floor Area	Window dimension	Direction and distance from NSR facade
Drama studio	51.8 m ²	1.4m x 2.3m	10.3m
Music room	71.5 m ²	1.4m x 1.435m	10.3m
Music room 02	15.8 m ²	1.4m x 1.435m	10.3m
Music room 03	7.5 m ²	1.4m x 1.435m	10.3m

Table 10 - Music room building glazing areas

Based on the same noise source levels and the minimum glazing performance, the cumulative music noise impact from the above rooms has been calculated to be 44 dBA and approximately NR 40, exceeding the music noise limit.

The calculations have shown that external glazing providing approximately 37 dB $R_w + C_{tr}$ sound insulation in music spaces would provide sufficient sound insulation to meet the noise limits above. Minimum octave band sound reduction performance requirements for the glazing are provided below:

Construction	Centre Octave Band Frequency, Hz Sound Reduction Indices (dB)			$R_w + C_{tr}$	R_w	Example construction
	63	125	250			
External Glazing	22	28	31	37	44	10mm glass / 16 mm argon filled gap / 8.8 mm Pilkington Optiphon

Table 11 - Minimum External Glazing Sound Insulation Requirements

It is also important that flanking sound does not reduce the sound insulation performance of the glazing / façade. Therefore, the following advice should be followed:

- The required sound insulation should be provided by the glazing system as a whole including any frame elements
- Penetrations in the external wall should be avoided and if required should be appropriately sealed
- Any ventilation paths between the rooms and external areas should be appropriately attenuated

8.0 Additional information

In response to the previous planning application (ref no. 20/0165/FUL) for the planning development a number of concerns related to noise were raised by Sharps Gayler LLP acting on behalf of a number of residents located adjacent to the development site.

Responses to these issues are contained in Cundall technical note 1018236-MEM-AS-001 dated 28th February 2020 included in appendix A. This covers the following issues:

- Noise from construction traffic
- Noise breakout from classrooms
- Noise breakout from music and drama classrooms (this report has been updated to assess a worst case scenario of all rooms generating high noise levels at the same time)
- Noise from external play / learning area
- Noise from external plant

9.0 Conclusion

An environmental noise assessment has been undertaken as part of a planning application for the proposed extension building for King's House School. Existing background noise levels at the site have been measured and compared to the relevant planning policy of London Borough of Richmond upon Thames.

Assessment of noise has been undertaken following the procedure set out by the Local Authority and the following noise limits have been set out accordingly:

- Plant noise limits for externally mounted plant
- Noise limits for music noise break-out from the school

If the noise limits and advice outlined in this report are complied with it is considered that the proposed development will meet the planning noise requirements of LBRuT. In addition, the development would be considered unlikely to result in significant adverse impacts on sensitive receptors as a result of noise.

Appendix A

1018236-MEM-AS-001 – see next page

Memorandum

Project:

King's House School

Date

28/02/2020

Subject

1018236-MEM-AS-001: Response to Noise Assessment report of planning objection to 20/0165/FUL

This note has been prepared to provide response to the concerns raised in the Noise Assessment report prepared by Sharps Gayler LLP (SGL) acting on behalf of residents adjacent to the proposed application site, and aims to clarify that the design of the proposed development at King's House School, 66-68 King's Road has been developed with due considerations to noise impact to the neighbouring residents.

Following review of the report, the following are understood to be the main concerns and are considered to form basis of the Planning Objection.

- Noise from construction and construction traffic;
- Noise breakout from Classrooms;
- Noise breakout from Music and Drama rooms;
- Noise from external play / learning areas;
- Noise from external plant.

It is important to note that Cundall's noise report was produced for the purpose of planning submission and therefore the report only includes information considered relevant or required at planning stage.

Although the SGL report does not make reference to the Supplementary Planning Document (SPD) of which *Development Control for Noise Generating and Noise Sensitive Development* adopted in September 2018 outlines specific noise policies of the London Borough of Richmond upon Thames (LBRuT), Cundall's noise report which accompanies the planning submission follows the guidance provided in this document and makes clear how the acoustic requirements are achieved by the proposed development.

The following sections outline responses for each of the above concern raised.

1.1 Noise from construction and construction traffic

The report highlights their concern for temporary but potentially high level of noise impact to the nearest residents and raises concern that there has been no assessment of the likely noise levels, duration of specific activity or equipment to be used, and the potential impacts and mitigation measures to be employed.

Detailed construction plan and programme are not determined at this early stage and such information is not typically prepared at planning.

However, once a contractor is appointed for the construction of the proposed development, the Contractor will be required to comply with LBRUT noise restrictions regarding construction noise and vibration, which could also be formalised within a S61 notice.

The Contractor is also expected to undertake noise / vibration monitoring, if required by the Local Authority.

1.2 Noise breakout from Classrooms

Concern has been raised about noise breakout from 'standard' Classrooms through open windows.

It is important to note that windows are not required to be opened to provide ventilation and would only be needed to be opened to provide additional air on hottest periods / days of summer for which the school is more likely to be on summer holiday and therefore the Classrooms are vacant.

Based on achieving the indoor ambient noise level criteria as set out in BB93 and on the measured ambient noise level around the site, minimum sound insulation performance of $32 \text{ dB } R_w + C_{tr}$ has been specified for the Classroom windows.

Based on typical noise level inside a classroom is about 57 dBA, minus approximate sound reduction through a façade with open window of 13 dB and distance attenuation of about 20 dB @10m, it can be seen that even with the windows open, classroom noise impact should not cause adverse noise impact at the nearest noise sensitive receptor.

As such, detailed noise impact assessment of the noise breakout from the Classrooms is considered unnecessary.

1.3 Noise breakout from Music and Drama rooms

SGL's report has raised concerns regarding cumulative sound levels from multiple music and drama rooms.

Noise impact from music and drama rooms have been assessed against achieving the noise limit set out in line with LBRuT's policies.

The background noise level which was used to set the noise limit, has been based on the most commonly occurring $L_{A90,5min}$ of the last hour of the school (i.e. 18:00 – 19:00 hrs taking into consideration the worst case after school activities) which was determined to be 42 dB L_{A90} (taken from the unattended measurement data). This is considered to be the worst-case scenario as the most commonly occurring $L_{A90,5min}$ throughout the day ranged between 44 and 48 dB L_{A90} over the 5-day measurement period.

The initial music noise breakout calculations outlined in Cundall's report have been undertaken based on music activities taking place in Music Room 02 (closest to the nearest residential building) and the Ensemble room. It is very unlikely that all music and drama rooms will generate the high level of noise continuously and simultaneously. However, further calculations are undertaken below to show additional activity noise impact based on the worst-case scenario of 4 no. music and drama spaces that directly face the nearest resident's building.

Cumulative noise impact from the following rooms have been calculated:

Room	Floor area	Window dimension	Direction and distance from nearest NSR facade
Drama Studio	59 m ²	1.6 m (w) x 2.2 m (h) 1.6 m (w) x 2.2 m (h)	South east facing @ 9m South facing @ 10.5m
Music room 02	7.5 m ²	1.6 m (w) x 2.2 m (h)	South east facing @ 9m
Music room 03	7.5 m ²	1.6 m (w) x 2.2 m (h)	South facing @ 10.5m
Music room	78.5 m ²	1.6 m (w) x 2.2 m (h) 1.6 m (w) x 2.2 m (h)	South east facing @ 9m South facing @ 10.5m

Based on the same noise source levels and the minimum glazing performance, the cumulative music noise impact from the above rooms has been calculated to be 44 dBA and approximately NR 40, exceeding the music noise limit. As such, the minimum sound insulation performance requirement may be increased to 37 dB R_w + C_{tr}.

It is important to note that the specification of the external glazing is yet to be determined and therefore increase to the minimum sound insulation performance of the external glazing to the music and drama spaces can be accommodated.

1.4 Noise from external play / learning areas

SGL's report also raises concerns relating to noise impact from 'external learning areas' and the existing 'garden' space.

These external spaces are either existing with no change of use or is significantly reduced in scale, and unlike the existing Sports Pitch or play area the activity noise should be much reduced. As such, noise impact from these areas, both ambient or maximum, should see no increase and it is likely that some reduction will be experienced at the nearest noise sensitive receptor.

Planting has not been taken into consideration as part of noise mitigation measures.

1.5 Noise from external plant

Noise emission limits from external plant items associated with the proposed development have been set out to be at least 5 dB below the existing background noise level, as stipulated in the SPD document. This approach SGL has stated that such approach is "reasonable". However, raises concern that no detailed noise impact assessment with specific plant specifications and layout have not been provided, and that no information has been provided to demonstrate how the plant noise will be controlled or mitigated to meet the noise emission limits.

The following statement has been provided in Cundall's noise report which is reproduced below for information:

"at this point in the design process, no detailed specification have been provided for building services installations associated with the proposed development. However suitable mitigation measures should be specified as necessary (e.g. screening or acoustic attenuators) in order to comply with the above noise emissions limits and to minimise any adverse impacts at the nearest noise sensitive receptors."

Specifications or design of external building services will undergo iterations during the design progress however they will be designed such that the cumulative noise impact will not exceed the proposed noise emissions limit at 1m from the façade of the nearest noise sensitive receptors, an approach considered reasonable and accepted by the LBRuT.

1.6 Additional information

The programme for the use of the external uses are as follows:

- Before school: outdoor play 08:00-08:30 hrs but not using the all-weather area adjacent to 64A
- Morning break: 11:00-11.30 hrs, no staggering
- Lunch is phased: younger boys 12:30-01:30 hrs; older 13:00-14:00 hrs (this is primarily to ensure efficiency in the dining hall).

1.7 Conclusion

In conclusion, due considerations have been given to the acoustic design of the proposed development to minimise noise impact from any potential noise impact from activities to align with the noise policy set out by the LBRuT and other national guidance.

Furthermore, the proposed development has sought to further reduce the existing noise impact by locating the new building to the southern side of the school, screening the external play area which is arguably the noisiest and most difficult to attenuate noise source expected from the school, from the properties at 64 and 64a King's Road.

