



Project

DfE Dixons Academy
Planning Condition 5a

Prepared for

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Published

13 June 2023

Quality Assurance	
Project Title:	DfE Dixons Academy
Report Title:	Planning Condition 5a
Report Number:	FS0998-SRL-XX-XX-T-J-0004-P01
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Version History

Version	Date	Comments	Approved by
PI	13/06/2023	Initial Issue	Joe Bear BEng(hons) MIOA

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Summary

I have assessed noise from fixed external plant associated with the temporary accommodation at Dixons Academy in line with the requirements of Planning Condition 5a.

I have found that the proposed plant items meet the requirements of Planning Condition 5a with no additional mitigation.

I would expect this report to be sufficient to discharge part 5a of the planning condition.

Plant noise levels will be measured on site after the plant is installed to demonstrate compliance with the relevant noise limits and to fully discharge the condition in accordance with the requirements of Planning Condition 5b.

Contents

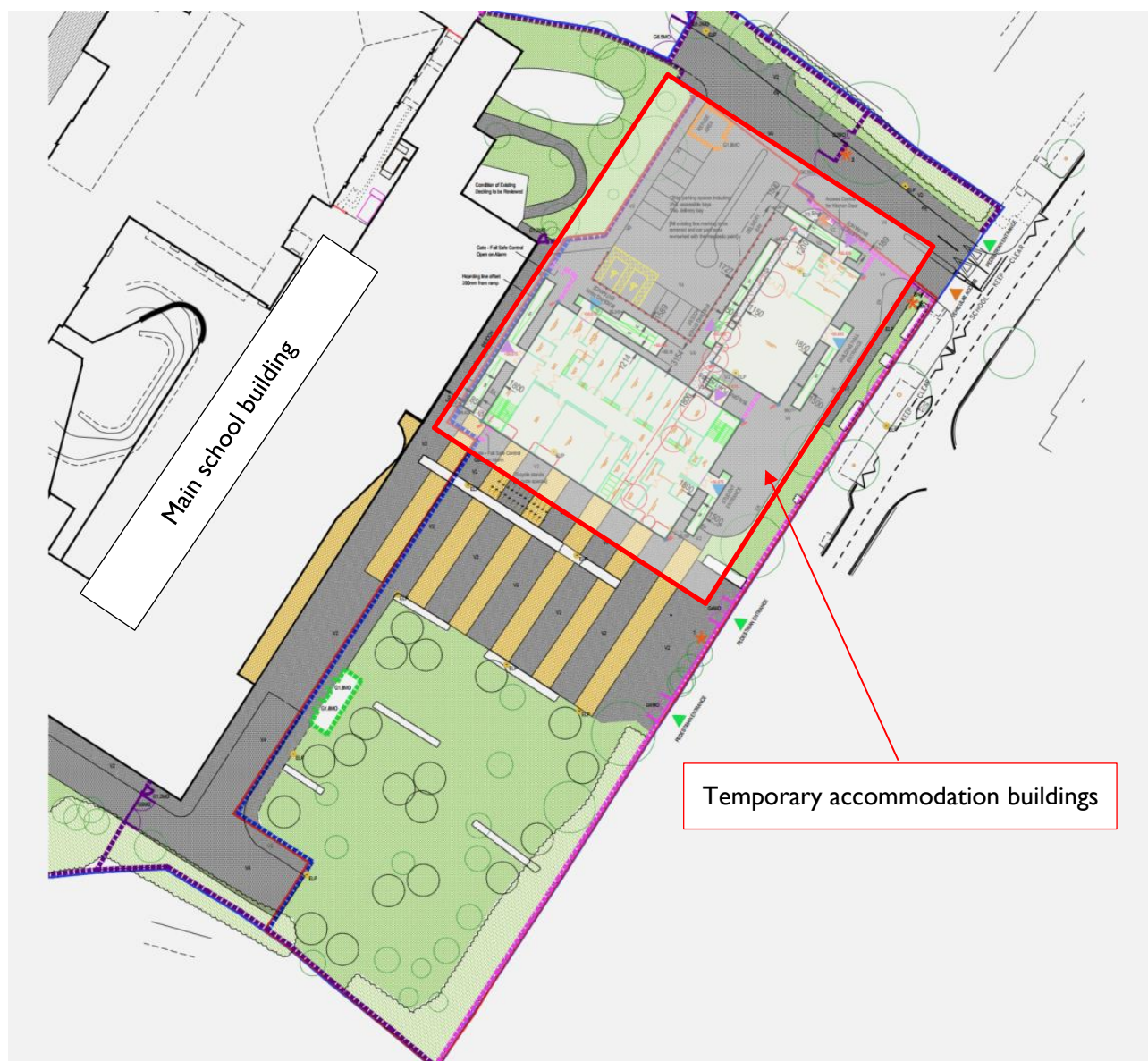
Summary.....	3
Contents.....	4
1.0 Introduction.....	5
2.0 Criteria.....	6
3.0 Proposed Plant Items.....	9
4.0 Noise Assessment.....	10
Appendix A – Plant Noise Data	12

1.0 Introduction

The existing building on the former Newall High School site on Greenbrow Rd, Manchester, M23 2SX is being redeveloped for the new Dixons Manchester Academy secondary school. While the refurbishment works are taking place in the main building the school will be housed in temporary accommodation on the site. The locations of the temporary accommodation buildings are shown in Figure I below.

Planning application I35845/FO/2022 relates to the erection of two temporary teaching and school accommodation buildings (Use Class F1) for a period of 3 years and has been approved with conditions. This includes a condition relating to noise levels from fixed mechanical plant associated with the temporary accommodation buildings. The condition is given in Section 2.0 below.

Figure I – Location of the temporary accommodation buildings



2.0 Criteria

2.1 Planning condition

Planning Condition 5 states that:

5 a) Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location. Prior to commencement of the use hereby approved the scheme shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the site. The scheme shall be implemented in full before the use commences.

b) Prior to the operation of the scheme a verification report shall be submitted to and approved in writing by the City Council as local planning authority to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic report. The report shall also undertake post completion testing to confirm that the noise criteria have been met. Any instances of non- conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.

The planning condition criterion requires the rating level of noise from plant and services to be no higher than 5 dBA below the background noise levels at the location of nearby noise sensitive receptors.

Rating level is defined in BS4142:2014+A1:2019 (BS4142). Note that the rating level includes penalties for any noticeable characteristics of the noise including tonality, impulsivity and intermittency. BS4142 is applicable to assessing sound at residential buildings or buildings used for residential purposes. This report therefore focusses on residential buildings, however we have also considered the noise affecting other building types for completeness and to provide a robust assessment.

2.2 Noise sensitive receptors

The locations of the nearby noise sensitive receptors are shown in Figure 2 below.

Figure 2 – Site location and nearby noise sensitive receptors – Site boundary approximate



Background noise levels were measured by Pace Consult in April 2022 (contained in report reference: PC-22-0086-RPI). We have used this noise data to develop appropriate plant noise limits during the quietest times that the building is expected to operate.

shows the measured background noise levels at the noise sensitive receptors (NSRs) and the respective plant noise limits, in accordance with the requirements of Planning Condition 5a.

Table I - Plant noise limits

NSR	Period	Measured Background Noise Level, dB L _{A90}	Plant Noise Limit, dB L _{Ar,Tr}
Neighbouring residential properties to the south or east of the site	Daytime (07:00 - 23:00)	41	36
	Night-time (23:00 - 07:00)	33	28 ¹
Neighbouring residential properties to the north or west of the site	Daytime (07:00 - 23:00)	37	33
	Night-time (23:00 - 07:00)	30	27 ¹

¹ These rating levels are considered to be low. Therefore, if it becomes difficult to achieve them in the final design, a relaxation may be appropriate in accordance with the Association of Noise Consultants guidance on applying BS4142 in practice.

3.0 Proposed Plant Items

The temporary accommodation buildings will have multiple external air handling condenser units located at ground floor level, wall mounted toilet extract fans, and kitchen extract and supply ventilation. The noise levels for these plant items are given in Appendix A and the overall A-weighted sound power levels are summarised in Table 2 below:

Table 2 - Plant items

Plant item	Number of units	Sound power level (SWL) per unit, dBA
AOYG45KBTB (External Condenser)	4	71
AOYG30KBTB (External Condenser)	4	69
AOYG24KMTA (External Condenser)	2	67
AOYG12KMCC (External Condenser)	4	65
Toilet extract fans	4	40
Kitchen extract fan outlet	1	82
Kitchen supply fan inlet	1	79
Kitchen extract fan casing breakout	1	60
Kitchen supply fan casing breakout	1	62

Noise data for the above units was provided by the supplier or obtained from the manufacturer, with the exception of fan casing breakout, which was estimated from the total sound power of the inlet and outlet fans breaking through typical 1 mm galvanised steel.

The kitchen fans have a 1250 mm attenuator fitted directly onto the unit, which will reduce the noise levels further. The insertion loss for the 1250 mm attenuator specified on both the kitchen extract and supply fans is given below:

Table 3 – Kitchen fan attenuator insertion loss

	Insertion Loss, dB							
	63	125	250	500	1k	2k	4k	8k
1250 mm attenuator	9	14	18	28	28	20	18	15

We understand that none of the plant will operate in the night.

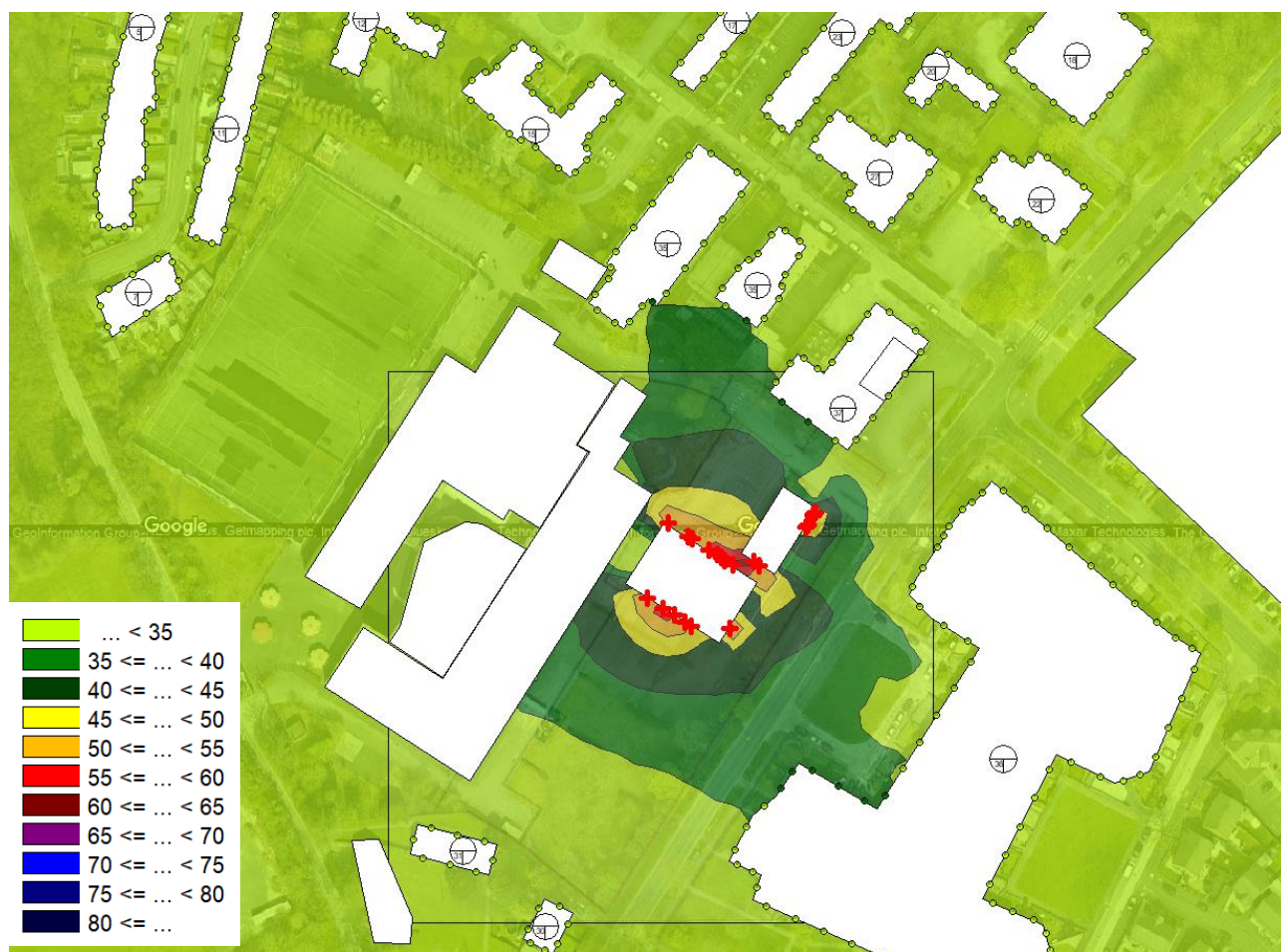
4.0 Noise Assessment

A 3D noise model of the site and surrounding area was created using drawings and information provided by the design team.

The manufacturer noise data was input into the noise model for all the relevant plant items as discussed in Section 3.0.

The spread of noise from the plant items was then calculated at all nearby noise sensitive receptors in line with the requirements of Planning Condition 5a. A screenshot of the 3D noise model is given in Figure 3.

Figure 3 – 3D noise model – Noise contours calculated at 1.5m high



4.1 Residential Buildings

The predicted plant noise levels and the relevant criteria are shown in Table 4 below.

Table 4 – Plant noise modelling results

Location	Period	Plant Noise Limit, dB $L_{Ar,Tr}$	Calculated Plant Noise Level, dB $L_{Ar,Tr}^1$	Compliant?
'Worst-case' residential property to the south of the site	Daytime (07:00 – 23:00)	≤ 36	30	✓
'Worst-case' residential property to the east of the site	Daytime (07:00 – 23:00)	≤ 36	35	✓
'Worst-case' residential property to the west of the site	Daytime (07:00 – 23:00)	≤ 33	10	✓
'Worst-case' residential property to the north of the site	Daytime (07:00 – 23:00)	≤ 33	22	✓

¹ We do not consider an acoustic character correction to be necessary in this case, due to the low absolute noise levels and the fact that the noise levels are dictated by the condenser units, which all have a slow ramp up/down as confirmed by the supplier.

The predicted plant noise levels are all at least 5 dBA below the background noise levels, as required by Planning Condition 5a for the temporary accommodation on site.

4.2 Non-residential Buildings

In addition to the residential buildings assessed above, there are a few educational buildings directly to the north of the temporary accommodation buildings. The calculated plant noise level at the 'worst case' educational building (i.e. the educational building exposed to the highest plant noise level) is predicted to be 35 dB $L_{Aeq,T}$. This is below the external ambient noise levels at site.

We would expect this to result in noise levels around 20 dB $L_{Aeq,T}$ or below in rooms with windows open for ventilation. The most stringent internal noise level criteria in Building Bulletin 93 – *Acoustic design of schools: performance standards*, February 2015 (BB93) is 30 dB $L_{Aeq,T}$ for classrooms intended specifically for students with special hearing and communication needs. It is clear therefore that the plant noise levels will not cause an exceedance of a suitable internal noise criteria in the nearby educational buildings.

All other non-residential buildings are exposed to similar or lower plant noise levels than those discussed above and are therefore also considered suitable.

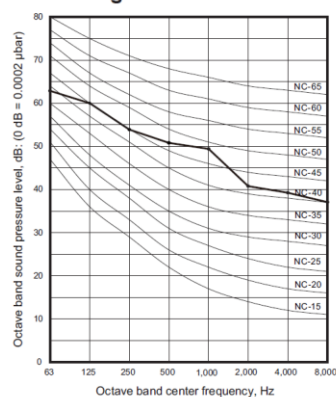
On this basis, we do not expect plant noise from the temporary accommodation to have any adverse impacts on the neighbouring non-residential buildings.

Appendix A – Plant Noise Data

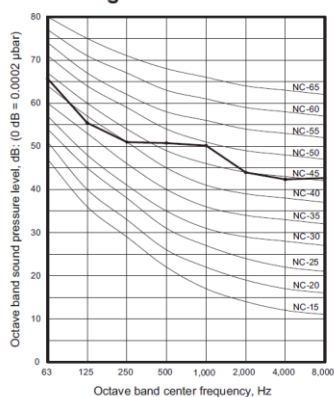
Air handling condenser units

■ Model: AOYG30KBTB

● Cooling

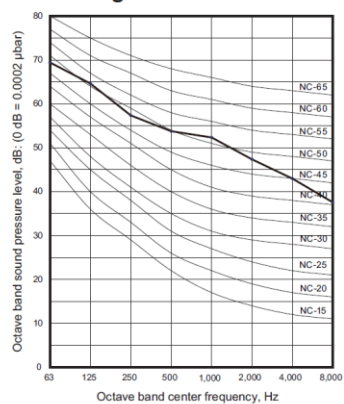


● Heating

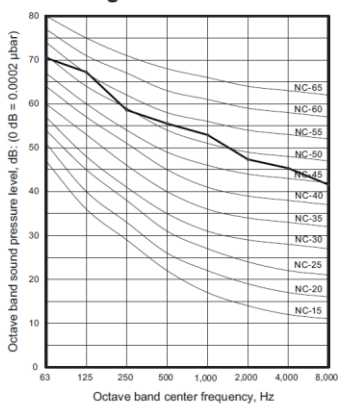


■ Model: AOYG45KBTB

● Cooling

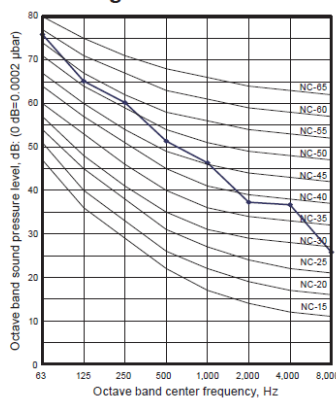


● Heating

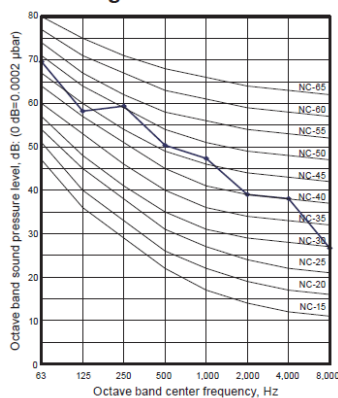


■ Model: AOYG24KMTA

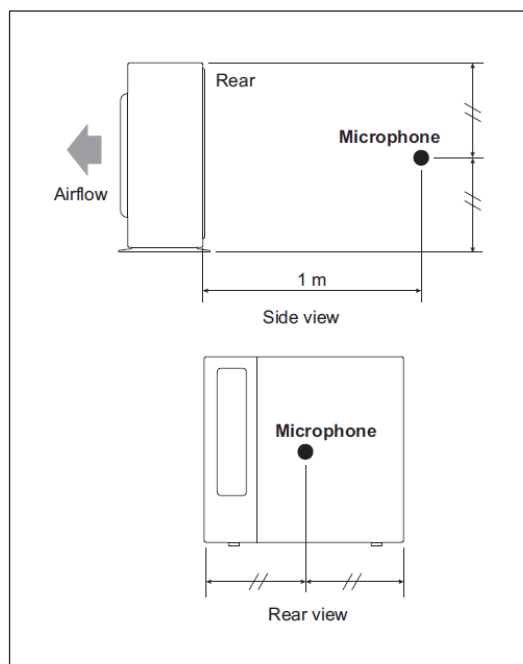
● Cooling



● Heating



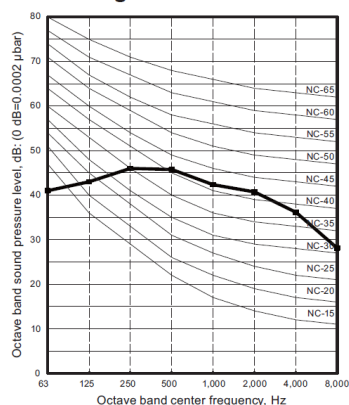
Measurement location



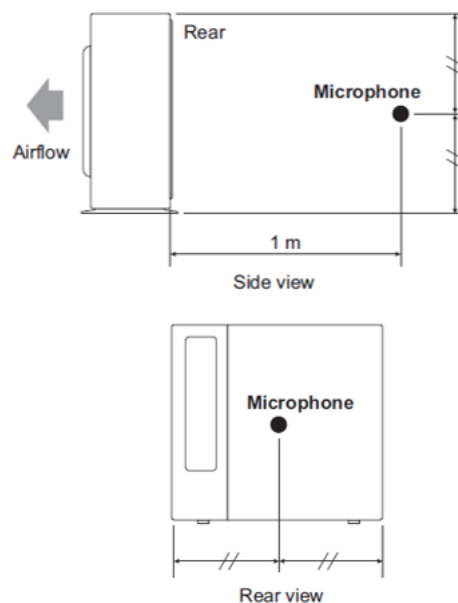
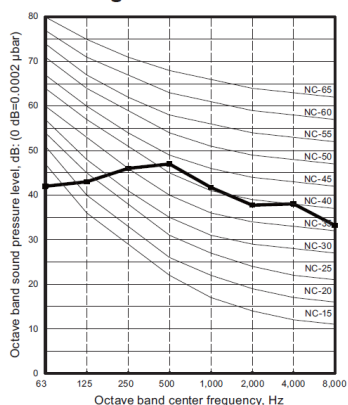
Measurement location

■ Model: AOYG12KMCC

● Cooling



● Heating



Kitchen extract and supply

EXTRACT FAN MOTOR - ACOUSTIC SOUND LEVELS										
MID FREQUENCY...	Hz	63	125	250	500	1K	2K	4K	8K	TOT
INLET	dB(A)	44	57	70	70	67	66	62	58	75
OUTLET	dB(A)	51	63	76	77	77	71	64	60	82
SILENCER LOSSES - 1250 LONG STRAIGHT THROUGH										
	dB(A)	-9	-14	-18	-28	-28	-20	-18	-15	
INLET DBA @ 3 MTR	33									
OUTLET DBA @ 3 MTR	38									

SUPPLY AIR FAN MOTOR - ACOUSTIC SOUND LEVELS										
MID FREQUENCY...	Hz	63	125	250	500	1K	2K	4K	8K	TOT
INLET	dB(A)	48	58	72	73	73	72	67	64	79
OUTLET	dB(A)	55	65	78	79	82	78	74	66	86
SILENCER LOSSES - 1250 LONG STRAIGHT THROUGH										
	dB(A)	-9	-14	-18	-28	-28	-20	-18	-15	
INLET DBA @ 3 MTR	38									
OUTLET DBA @ 3 MTR	45									

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