



APPENDIX 12.3_PLANT NOISE ASSESSMENT

on behalf of

IQ STUDENT ACCOMMODATION LTD

for the site at

ECHO STREET, MANCHESTER

REPORT DATE: **MARCH 2023**

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CadnaA Modelling

General Inputs

Predictions of noise from mechanical services plant has been undertaken using CadnaA noise modelling software, and compared to the existing background noise levels measured at the site. This enables a direct comparison of mechanical services noise compared with the existing background level rather than simply observing a change (or lack thereof) in the overall level. Specific model parameters have been applied as follows:

- Propagation of noise has been modelled using algorithms within ISO 9613:1993 Acoustics - Attenuation of sound during propagation outdoors
- Default ground absorption $G = 0.0$ (equivalent to and consistent with the hard ground cover present at the site)
- Ground attenuation: spectral all sources
- No adverse meteorological effects
- Two orders of reflection
- Buildings are reflecting (smooth, non-structured façade)
- Topographical data was obtained using emapsite 2 m contours for the area surrounding the site and data from site observations and topographical data provided by the client has been used for the site.
- The heights of existing buildings within the noise model have been estimated using Google Earth and site observations.
- Noise levels have been predicted at the most adversely affected façade are incident façade levels i.e. no reflections. Noise levels for sensitive receptors positioned in open spaces are free-field.

Mechanical Services Plant

Mechanical services plant has been modelled using manufacturers data where available, and this data is summarised in **Table A12.3.1** below:

Table A12.3.1 Noise Sensitive Receptors

Unit	No.	Tower	Sound Power Level (dB) at octave band centre frequency (Hz)								Sound Power Level (dBA)
			63	125	250	500	1k	2k	4k	8k	
Mitsubishi QTon	3	A	83	67	64	65	63	58	55	55	68
	5	B	83	67	64	65	63	58	55	55	68
	5	C	83	67	64	65	63	58	55	55	68
Daikin RXYSQ12TY1	1	A	-	79	73	75	72	66	63	55	76
	2	B	-	79	73	75	72	66	63	55	76
	2	C	-	79	73	75	72	66	63	55	76
Exhaust Flue (roof level)	1	C	N/A								54
Other roof mounted equipment*	1	A	77	71	69	63	61	47	38	24	66
Other roof mounted equipment*	1	B	69	72	71	53	52	39	23	9	64
Other roof mounted equipment*	1	C	75	68	59	50	53	40	27	16	58
Basement plant room*	1	A	85	89	88	84	79	69	58	51	85
Basement plant room*	1	C	79	82	79	65	54	43	37	30	72
* Details of assumed equipment is described in detail in the following sections											

Noise levels for roof-mounted mechanical services equipment has been based on library data of similar noise sources as specific noise data for these items has not been made available. The noise levels cover the anticipated noise levels from domestic hot water storage cylinders, expansion vessels, circulation pumps, smoke extract fans, laundry supply and extract fans, and any noise from electrical control panels.

In the absence of specific details of these plant items and the noise levels from them, it is not possible to undertake detailed assessment of these noise sources.

Location of Selected Noise Sensitive Receptors

Table A12.3.2 provides details of the noise sensitive receptors including their sensitivity.

Table A12.3.2 Noise Sensitive Receptors

ID	Noise Sensitive Receptor	Sensitivity of Receptor
1	Barnes Wallis Building, North	Medium
2	Barnes Wallis Building, West (Ground Floor)	Medium
3	Barnes Wallis Building, East (Ground Floor)	Medium
4	Barnes Wallis Building, West (Middle Floor)	Medium
5	Barnes Wallis Building, East (Middle Floor)	Medium
6	Barnes Wallis Building, West (Top Floor)	Medium
7	Barnes Wallis Building, East (Top Floor)	Medium
8	Echo Street Office	Low
9	Fairfield Hall (Ground Floor)	High
10	Fairfield Hall (Middle Floor)	High
11	Fairfield Hall (Top Floor)	High
12	Joule Library, East	High
13	Joule Library, South	High
14	Lambert House, East (Ground Floor)	High
15	Lambert House, West (Ground Floor)	High
16	Lambert House, East (Middle Floor)	High
17	Lambert House, West (Middle Floor)	High
18	Lambert House, West (Top Floor)	High
19	Lambert House, East (Top Floor)	High
20	London Road Fire Station	High
21	Macdonald Hotel (Top Floor)	High
22	Maths & Science Building, West (Ground Floor)	Medium
23	Maths & Science Building, East (Ground Floor)	Medium
24	Maths & Science Building, West (Middle Floor)	Medium
25	Maths & Science Building, East (Middle Floor)	Medium
26	Maths & Science Building, West (Top Floor)	Medium
27	Maths & Science Building, East (Top Floor)	Medium
28	Pendulum Hotel	High
29	Renold Building	Medium
30	Staff House	Medium
31	The Bulls Head Pub	High
32	Velvet House	High
33	Vimto Park	Low

BS 4142:2014+A1:2019 Assessment

A BS 4142 noise impact assessment has been undertaken in order to assess the potential noise impact at the nearest and most affected noise sensitive receptors due to the

operational plant noise from the proposed development. The results from the noise modelling are compared against the existing background noise levels at the site (previously measured) to determine the potential for impact.

Table A12.3.3 BS 4142 Noise Impact Assessment Off-site

Results		Relevant Clauses of BS 4142:2014	Commentary
Measured Ambient Noise Level	$L_{Aeq,8hr} = 53 \text{ dB}$	7.3.1	Lowest measured overnight ambient level
Lowest Background Sound Level	$L_{A90,15mins} = 47 \text{ dB}$	8.1.2 8.3	Lowest level measured
Assessment made during the night-time, so the reference interval is 15 min		7.2	
Specific Sound Level (Receptor 10: Fairfield Hall (Middle Floor))	$L_{Aeq,15mins} = 33 \text{ dB}$	7.3.3 eqn. (2)	
Acoustic feature correction	0 dB	9.2	No character
Rating Level	$(33 + 0) \text{ dB} = 33 \text{ dB}$		
Excess of Rating Level over Background Sound Level	$(47 - 33) \text{ dB} = -14 \text{ dB}$		i.e. rating level is below background sound level
Assessment indicates likelihood of significant adverse impact		11	Initial estimate only
Context		11 8.5	The assessment relates to existing receptors where the environment is dominated by traffic and mechanical services noise sources
Uncertainty of the assessment		10	There is a degree of uncertainty in determining the Background Sound Level at the receptor but this has been mitigated by using the lowest measured background levels over a 7-day period to ensure a representative sample has been measured

It can be seen from Table A12.3.3 above, the highest noise levels predicted at any receptor is expected to be below the existing background noise level and therefore unlikely to be perceptible or have any impact on the existing levels of amenity at the site.

Summary

Provided the noise levels from the mechanical services proposed for the site do not exceed those that are specified in this report, we would not expect any significant impact on existing amenity on the grounds of noise. To ensure, that mechanical services noise is

controlled as details of mechanical services are finalised, appropriate planning conditions should be applied to the site.

Detailed calculations of mechanical services noise should then be carried out to ensure that noise from these services is controlled and mitigation is specified where necessary.