

Liddell Road, Camden

Noise Assessment

December 2023

Liddell Road - Noise Assessment

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EXECUTIVE SUMMARY

This report provides a design stage noise assessment of noise emission at Liddell Road, Camden. The development is for 'Phase 2 of comprehensive, mixed-use redevelopment involving the construction new buildings: Block A (5 storeys) to provide 3,700 sqm (GIA) of mixed commercial (Class B1), Block B (11 storeys) and Block C (5 storeys) to provide 106 residential units (Class C3) and associated public realm landscaping works'. This assessment has been carried out on behalf of CField Construction.

An assessment of noise emission from Block A has shown that the noise limits of condition 28 is not likely to be exceeded. The proposals will incorporate sufficient noise mitigation measures which are set in this report.

In our opinion, this report provides sufficient information to partially discharge condition 28 for Block A.



INTRODUCTION

This report has been prepared to provide a design stage noise emission assessment for the development at Liddell Road, Camden. The development is for the 'Phase 2 of comprehensive, mixed-use redevelopment involving the construction of three new buildings: Block A (5 storeys) to provide 3,700 sqm (GIA) of mixed commercial use (Class B1), Block B (11 storeys) and Block C (5 storeys) to provide 106 mixed tenure residential units (Class C3) and associated public realm landscaping works'

The assessment has been carried out on behalf of CField Construction.

The development was granted planning permission in March 2015 and a Non-Material Amendment was granted in November 2022. The Decision Noticeⁱ lists a number of conditions, of which condition 28 relates to noise emission from building services plant. The aim of this assessment is to determine if the proposals are likely to meet the condition requirements for Block A.

Noise surveys were carried out prior to commencement of the construction. These surveys provide the preexisting background noise levels that have been used in assessment. The survey results are reproduced in this report.

SITE DETAILS

The site is currently under construction. The site is bound by Maygrove Road to the south, the North London Line to the north, Kingsgate Primary School to the east and Maygrove Peace Park to the west. There are mixed residential properties adjoining the suite along Maygrove Road and adjacent to the site on the opposite side of Maygrove Road.

The site will be of mixed use and therefore there are both noise emitters and receivers on the site as well as off site.

PLANNING CONDITION 28

The planning condition wording from the November 2022 decision is reproduced below for ease of reference.

REPLACEMENT CONDITION 28

Prior to the occupation of each block hereby permitted, details of the external noise level emitted from plant/machinery/equipment, and mitigation measures as appropriate, shall be submitted to and approved in writing by the Local Planning Authority.

The measures shall ensure that the external noise level emitted from plant/machinery/equipment will be lower than the lowest existing background noise level by at least 5dBA, by 10dBA where the source is tonal, as assessed according to BS4142:2014 at the nearest and/or most affected noise sensitive premises, with all machinery operating together at maximum capacity.

A post-installation noise assessment shall be carried out where required to confirm compliance with the noise criteria and additional steps to mitigate noise shall be taken, as necessary. Approved details shall be implemented prior to occupation of the development and thereafter be permanently retained.

Reason: To safeguard the amenities of future occupiers in accordance with the requirements of policy CS5 of the London Borough of Camden Local Development Framework Core Strategy and policies DP26 and DP28 of the London Borough of Camden Local Development Framework Development Policies.



It is noted that the wording cites reference to Policy CS5, DP26 and DP28 for the reason the condition is imposed.

ASSESSMENT CRITERIA

Condition 28 requires that noise emission from "plant/machinery/equipment" herewith refereed to as building service plant, is controlled so that it is at least 5 dB (A) lower than background noise level. If the building service plant noise contains tonality, then the condition requires the noise to be controlled so that it is at least 10 dB (A) lower than the background noise level.

The rating and assessment methodology of BS 4142: 2014ⁱⁱ is to be used.

NOISE LEVEL MEASUREMENTS

The pre-existing background noise levels on the site and surrounding areas have been measured by different consultants. Each of the three surveys used a measurement location near to the northern boundary and another location that represented the receptors near to the southern boundary. The measurement location figures from each of the reports is reproduced below. A Google Earth image showing measurement locations A and B is given below in Figure 1.



Position B Rear of Commercial Unit 22 Figure 1: Gillieron Scott Measurement Locations

A Google Earth image showing measurement locations D and E is given below in Figure 2.





Figure 2: Arup Measurement Locations

A Google Earth image showing measurement locations 1, 2 and 3 is given below in Figure 3.



Figure 3: NRG Measurement Locations

Noise level survey results from each of the three reports are reproduced in Table 1 below.

Table 1: Noise level measurements

Consultant	Ref	Location	Day L _{A90} dB	Evening LA90 dB	Night L _{A90} dB	Comments
Gillieron Scott	05/12/2014	A (north)	42.2	36.0	30.9	Minimum LA90,15min dB
Gillieron Scott	05/12/2014	B (south)	42.5	35.9	31.0	Minimum LA90, 15min dB
Arup	04/08/2021	D (north)	42.3	41.6	39.6	Arithmetic mean LA90 5min dB
Arup	04/08/2021	E (south)	46.8	42.1	36.9	Arithmetic mean LA90 5min dB
Arup	04/08/2021	D (north)	32.1	38.0	32.1	Minimum LA90, 5min dB
Arup	04/08/2021	E (south)	39.2	38.6	32.3	Minimum L _{A90, 5min} dB
NRG	19/04/2022	1 (south	41.6	-	-	La90, 1 hr dB
NRG	19/04/2022	2 (north)	41.5	-	-	LA90, 1 hr dB
NRG	19/04/2022	3 (west)	43.9	-	-	LA90, 1 hr dB

The values in Table 1 show that typically the ambient background L_{A90} dB noise levels are in the range of 41 dB (A) to 43 dB (A) at the nearest northern and southern receptors to the site during the daytime. During the evening and night time, the average L_{A90} dB shows only a minor variation, falling to 39.6 dB (A). However, the minimum measured $L_{A90, 15min}$ dB noise level during the evening and night time was significantly lower at 30.9 dB (A).



ASSESSMENT OF BUILDING SERVICES NOISE EMISISON

The condition requires that noise emission from machinery, equipment, extract/ventilation ducting, mechanical installations is at least 5 dB (A) below the background level at 1 metre from the window of any residential property. In order to calculate the likely noise emission, the building services proposals need to be considered.

A list of the plant to be installed as communicated to us by the design team, is shown in Table 2 below. The noise levels are taken from manufacturer published data, which is reproduced in Appendix A.

Block	Plant	Model	Туре	Location	Standard mode Lw dB (A)	Quiet mode Lw dB (A)
Α	CU 01	U-30MF3E8	VRF	Roof	77	71
Α	CU 02	U-32MF3E8	VRF	Roof	78	70
Α	CU 03	U-32MF3E8	VRF	Roof	78	71
А	CU 04	U-32MF3E8	VRF	Roof	78	71
Α	CU 05	U-26MF3E8	VRF	Roof	76	71
Α	CU 06	U-12MF3E8	VRF	Roof	79	71
Α	EWH-A-01	Megaflo Flexistor 1000	Hot water store	Plant room	50	
A	AHU 01	Q12118-01-06	AHU	Plant room	94	
A	DHWRP-A-01	MAGNA3 25-40 N	Pump	Plant room	43	
Α	ODH-B-01	BIDDLE/DF L-200-EC	Overdoor heater	Plant room	51	
Α	CAT-A-01	DUTYPOINT WX2-3080-1650-AB.A	Booster pump	Plant room	59	
Α	CWSTP-A-02	DUTYPOINT WX2-9060-2250-AB.A	Booster pump	Plant room	59	

Table 2: List of proposed building services plant

The VRF units on Block A roof will be fitted with acoustic enclosures and operate in night mode during 23hrs to 07hrs, as indicted on the Block A roof plan drawing in Appendix B. The AHU in Block A plant room will be fitted with attenuators. The ASHP on block B roof will be operated in 'Silent Mode' at night time (23hrs to 07hrs). All of the MEV units will be fitted with attenuators on the exhaust duct to atmosphere. The acoustic requirements for the VRF enclosure and AHU attenuators is shown in Table 3.

Table 3: Plant mitigation, losses required in octave bands dB

Plant	Mitigation	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz
VRF	Enclosure	13.0	15.5	19.5	21.0	18.5	21.0	22.5	23.5
AHU 01 intake	Attenuator	21	18	11	13	14	20	21	17
AHU 01 Exhaust	Attenuator	24	22	16	17	18	24	25	21
AHU 02 intake	Attenuator	21	18	11	13	14	20	21	17
AHU 02 Exhaust	Attenuator	24	22	16	17	18	24	25	21
MEV exhaust	Attenuator	-1	-3	5	6	12	18	12	9

The plant sound power levels shown in Table 2 and the mitigation losses shown in Table 3 have been used to digitise each item of plant in a computational noise model. Software Lima-Predictor V2023 has been used to calculated predicted noise levels at sample receptors and grid points. Noise emission from the ASHPs has been calculated using the methodology in ISO 9613: 1996ⁱⁱⁱ, with atmospheric conditions set to 20 Celsius, 60% humidity and 101.325 kPa air pressure. Terrain data has been taken from OS Mapping by overlaying the 1:25k tile with a Google Earth image of the site. Google Earth has been used to obtain the height of surrounding buildings.

The predicted combined noise emission for all building service plant at 1 metre from the nearest adjacent noise sensitive receptors is shown in Table 3 below. The calculation assumes all plant is operating at 100% duty.

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Sample reference	Receptor Name	Height metres	Predicted Day time LAeq dB	Predicted Night time L _{Aeq} dB
R1	Block B	20	30.6	23.6
R1	Block B	23	32.1	26.2
R1	Block B	26	32.7	26.0
R1	Block B	29	32.5	25.9
R1	Block B	32	32.1	25.7
R2	Block C	1.5	24.2	9.6
R2	Block C	4.5	24.5	10.1
R2	Block C	7.5	24.8	11.0
R2	Block C	10.5	25.2	13.1
R2	Block C	13.5	26.0	15.2
R3	Clay Yard 1	7.5	22.5	15.6
R3	Clay Yard 1	4.5	22.5	15.0
R3	Clay Yard 1	1.5	24.5	17.0
R4	Clay Yard 2	7.5	25.9	11.5
R4	Clay Yard 2	4.5	26.1	11.5
R4	Clay Yard 2	1.5	26.1	14.2
R5	Kingsgate Primary Lower School 1	4.5	23.9	17.6
R6	Kingsgate Primary Lower School 2	4.5	22.8	19.8
R7	Interlink House 1	4.5	27.2	21.6
R7	Interlink House 1	7.5	27.4	21.5
R7	Interlink House 1	10.5	27.5	21.3
R7	Interlink House 1	13.5	27.5	20.8
R8	73 Maygrove Road E	7.5	22.3	14.1
R8	73 Maygrove Road E	10.5	27.0	18.0
R9	73 Maygrove Road N	7.5	19.8	10.4
R9	73 Maygrove Road N	10.5	22.5	14.6
R9	73 Maygrove Road N	13.5	25.6	17.3
R10	77 Maygrove Road	1.5	24.1	13.2
R10	77 Maygrove Road	4.5	27.0	16.5
R10	77 Maygrove Road	7.5	28.2	18.3
R10	77 Maygrove Road	10.5	28.6	18.9
R11	75 Maygrove Road	1.5	26.2	17.2
R11	75 Maygrove Road	4.5	33.8	23.9
R11	75 Maygrove Road	7.5	33.6	23.1
R12	134 Maygrove Road	1.5	21.6	9.2
R12	134 Maygrove Road	4.5	22.5	13.0
R12	134 Maygrove Road	7	23.0	13.8
R13	150 Maygrove Road	1.5	27.6	5.4
R13	150 Maygrove Road	4.5	27.9	9.6
R14	166 Maygrove Road	1.5	28.7	8.4
R14	166 Maygrove Road	4.5	28.9	8.5

The sample receptor location names are as indicated by Figure 4 overleaf. Figure 4 shows the predicted noise contours for the day time period at 4 metres above ground level. Figure 5 shows the predicted noise contours night time at 4 meters above ground level.



Figure 4: Day time noise contours at 4 metres above ground level



Figure 5: Night time noise contours at 4 metres above ground level



The methodology of BS 4142:2014 has been used to determine the impact of the rated noise level on the neighbouring uses. It has been assumed that any tonality will not be perceptible, as the noise sources are typically relatively broadband and the absolute level is low.

Table 5 below shows a summary of the noise emission assessment of combined plant operation at a sample of the nearest neighbours in the day time.

Sample reference	Receptor Name	Height metres	Predicted Day L _{Aeq} dB	Day L _{A90} dB	Excess over background	Compliance with 5 dB below background
R1	Block B	20	30.6	42.3	-11.7	Yes
R1	Block B	23	32.1	42.3	-10.2	Yes
R1	Block B	26	32.7	42.3	-9.6	Yes
R1	Block B	29	32.5	42.3	-9.8	Yes
R1	Block B	32	32.1	42.3	-10.2	Yes
R2	Block C	1.5	24.2	42.3	-18.1	Yes
R2	Block C	4.5	24.5	42.3	-17.8	Yes
R2	Block C	7.5	24.8	42.3	-17.5	Yes
R2	Block C	10.5	25.2	42.3	-17.1	Yes
R2	Block C	13.5	26	42.3	-16.3	Yes
R3	Clay Yard 1	7.5	22.5	42.3	-19.8	Yes
R3	Clay Yard 1	4.5	22.5	42.3	-19.8	Yes
R3	Clay Yard 1	1.5	24.5	42.3	-17.8	Yes
R4	Clay Yard 2	7.5	25.9	42.3	-16.4	Yes
R4	Clay Yard 2	4.5	26.1	42.3	-16.2	Yes
R4	Clay Yard 2	1.5	26.1	42.3	-16.2	Yes
R5	Kingsgate Primary Lower School 1	4.5	23.9	42.3	-18.4	Yes
R6	Kingsgate Primary Lower School 2	4.5	22.8	42.3	-19.5	Yes
R7	Interlink House 1	4.5	27.2	42.3	-15.1	Yes
R7	Interlink House 1	7.5	27.4	42.3	-14.9	Yes
R7	Interlink House 1	10.5	27.5	42.3	-14.8	Yes
R7	Interlink House 1	13.5	27.5	42.3	-14.8	Yes
R8	73 Maygrove Road E	7.5	22.3	42.3	-20	Yes
R8	73 Maygrove Road E	10.5	27	42.3	-15.3	Yes
R9	73 Maygrove Road N	7.5	19.8	42.3	-22.5	Yes
R9	73 Maygrove Road N	10.5	22.5	42.3	-19.8	Yes
R9	73 Maygrove Road N	13.5	25.6	42.3	-16.7	Yes
R10	77 Maygrove Road	1.5	24.1	42.3	-18.2	Yes
R10	77 Maygrove Road	4.5	27	42.3	-15.3	Yes
R10	77 Maygrove Road	7.5	28.2	42.3	-14.1	Yes
R10	77 Maygrove Road	10.5	28.6	42.3	-13.7	Yes
R11	75 Maygrove Road	1.5	26.2	42.3	-16.1	Yes
R11	75 Maygrove Road	4.5	33.8	42.3	-8.5	Yes
R11	75 Maygrove Road	7.5	33.6	42.3	-8.7	Yes
R12	134 Maygrove Road	1.5	21.6	42.3	-20.7	Yes
R12	134 Maygrove Road	4.5	22.5	42.3	-19.8	Yes
R12	134 Maygrove Road	7	23	42.3	-19.3	Yes
R13	150 Maygrove Road	1.5	27.6	42.3	-14.7	Yes
R13	150 Maygrove Road	4.5	27.9	42.3	-14.4	Yes
R14	166 Maygrove Road	1.5	28.7	42.3	-13.6	Yes
R14	166 Maygrove Road	4.5	28.9	42.3	-13.4	Yes

Table 5: Assessment of predicted noise at 1 metre from nearest receptors, day time periods

The assessment in Table 5 shows a negative excess of rating level above background during the daytime at all of the sample receptor locations. As the negative excess is less 5 dB below background, the assessment shows compliance with condition requirements. The combined operation of the plant is predicted to comply with the

noise limits set by condition 28 in the day time. There is predicted to be at least 3.5 dB (A) compliance margin with the condition requirements at all locations during the night time.

Table 6 below shows a summary of the noise emission assessment of combined plant operation at a sample of the nearest neighbours in the night time.

R1 Block B 20 23.6 32.1 -8.5 Yes R1 Block B 23 26.2 32.1 -5.9 Yes R1 Block B 26 26 32.1 -6.1 Yes R1 Block B 29 25.9 32.1 -6.2 Yes R1 Block B 32 25.7 32.1 -6.4 Yes R1 Block C 1.5 9.6 32.1 -22.5 Yes R2 Block C 4.5 10.1 32.1 -22.5 Yes R2 Block C 7.5 11 32.1 -22.5 Yes R2 Block C 10.5 13.1 32.1 -21.1 Yes R2 Block C 10.5 13.1 32.1 -19 Yes R2 Block C 13.5 15.2 32.1 -16.9 Yes R3 Clay Yard 1 7.5 15.6 32.1 -16.5 <	Sample reference	Receptor Name	Height metres	Predicted Night L _{Aeq} dB	Night Lago dB	Excess over background	Compliance with 5 dB below background
R1 Block B 23 26.2 32.1 -5.9 Yes R1 Block B 26 26 32.1 -6.1 Yes R1 Block B 29 25.9 32.1 -6.2 Yes R1 Block B 32 25.7 32.1 -6.4 Yes R1 Block C 1.5 9.6 32.1 -22.5 Yes R2 Block C 4.5 10.1 32.1 -22.2 Yes R2 Block C 4.5 10.1 32.1 -22.2 Yes R2 Block C 7.5 11 32.1 -21.1 Yes R2 Block C 10.5 13.1 32.1 -19 Yes R2 Block C 10.5 13.1 32.1 -19 Yes R2 Block C 13.5 15.2 32.1 -16.9 Yes R3 Clay Yard 1 7.5 15.6 32.1 -16.5 <	R1	Block B	20	23.6	32.1	-8.5	Yes
R1 Block B 26 26 32.1 -6.1 Yes R1 Block B 29 25.9 32.1 -6.2 Yes R1 Block B 32 25.7 32.1 -6.4 Yes R2 Block C 1.5 9.6 32.1 -22.5 Yes R2 Block C 4.5 10.1 32.1 -22 Yes R2 Block C 7.5 11 32.1 -22 Yes R2 Block C 10.5 13.1 32.1 -21.1 Yes R2 Block C 10.5 13.1 32.1 -19 Yes R2 Block C 10.5 15.2 32.1 -16.9 Yes R3 Clay Yard 1 7.5 15.6 32.1 -16.5 Yes R3 Clay Yard 1 4.5 15 32.1 -17.1 Yes R3 Clay Yard 1 1.5 17 32.1 -15.1	R1	Block B	23	26.2	32.1	-5.9	Yes
R1 Block B 29 25.9 32.1 -6.2 Yes R1 Block B 32 25.7 32.1 -6.4 Yes R2 Block C 1.5 9.6 32.1 -22.5 Yes R2 Block C 4.5 10.1 32.1 -22.2 Yes R2 Block C 7.5 11 32.1 -22 Yes R2 Block C 7.5 11 32.1 -21.1 Yes R2 Block C 10.5 13.1 32.1 -19 Yes R2 Block C 10.5 13.1 32.1 -16.9 Yes R2 Block C 13.5 15.2 32.1 -16.5 Yes R3 Clay Yard 1 7.5 15.6 32.1 -16.5 Yes R3 Clay Yard 1 4.5 15 32.1 -17.1 Yes R3 Clay Yard 1 1.5 17 32.1 -15.1	R1	Block B	26	26	32.1	-6.1	Yes
R1 Block B 32 25.7 32.1 -6.4 Yes R2 Block C 1.5 9.6 32.1 -22.5 Yes R2 Block C 4.5 10.1 32.1 -22.5 Yes R2 Block C 7.5 11 32.1 -22 Yes R2 Block C 7.5 11 32.1 -21.1 Yes R2 Block C 10.5 13.1 32.1 -19 Yes R2 Block C 10.5 13.1 32.1 -19 Yes R2 Block C 13.5 15.2 32.1 -16.9 Yes R3 Clay Yard 1 7.5 15.6 32.1 -16.5 Yes R3 Clay Yard 1 4.5 15 32.1 -17.1 Yes R3 Clay Yard 1 1.5 17 32.1 -15.1 Yes R4 Clay Yard 2 7.5 11.5 32.1 -20.6 <td>R1</td> <td>Block B</td> <td>29</td> <td>25.9</td> <td>32.1</td> <td>-6.2</td> <td>Yes</td>	R1	Block B	29	25.9	32.1	-6.2	Yes
R2 Block C 1.5 9.6 32.1 -22.5 Yes R2 Block C 4.5 10.1 32.1 -22 Yes R2 Block C 7.5 11 32.1 -21.1 Yes R2 Block C 10.5 13.1 32.1 -19 Yes R2 Block C 10.5 13.1 32.1 -19 Yes R2 Block C 13.5 15.2 32.1 -16.9 Yes R3 Clay Yard 1 7.5 15.6 32.1 -16.5 Yes R3 Clay Yard 1 4.5 15 32.1 -17.1 Yes R3 Clay Yard 1 1.5 17 32.1 -15.1 Yes R4 Clay Yard 2 7.5 11.5 32.1 -20.6 Yes	R1	Block B	32	25.7	32.1	-6.4	Yes
R2 Block C 4.5 10.1 32.1 -22 Yes R2 Block C 7.5 11 32.1 -21.1 Yes R2 Block C 10.5 13.1 32.1 -19 Yes R2 Block C 10.5 13.1 32.1 -19 Yes R2 Block C 13.5 15.2 32.1 -16.9 Yes R3 Clay Yard 1 7.5 15.6 32.1 -16.5 Yes R3 Clay Yard 1 4.5 15 32.1 -17.1 Yes R3 Clay Yard 1 1.5 17 32.1 -15.1 Yes R4 Clay Yard 2 7.5 11.5 32.1 -20.6 Yes	R2	Block C	1.5	9.6	32.1	-22.5	Yes
R2 Block C 7.5 11 32.1 -21.1 Yes R2 Block C 10.5 13.1 32.1 -19 Yes R2 Block C 13.5 15.2 32.1 -16.9 Yes R3 Clay Yard 1 7.5 15.6 32.1 -16.5 Yes R3 Clay Yard 1 4.5 15 32.1 -17.1 Yes R3 Clay Yard 1 1.5 17 32.1 -15.1 Yes R4 Clay Yard 2 7.5 11.5 32.1 -20.6 Yes	R2	Block C	4.5	10.1	32.1	-22	Yes
R2 Block C 10.5 13.1 32.1 -19 Yes R2 Block C 13.5 15.2 32.1 -16.9 Yes R3 Clay Yard 1 7.5 15.6 32.1 -16.5 Yes R3 Clay Yard 1 4.5 15 32.1 -17.1 Yes R3 Clay Yard 1 1.5 17 32.1 -15.1 Yes R4 Clay Yard 2 7.5 11.5 32.1 -20.6 Yes	R2	Block C	7.5	11	32.1	-21.1	Yes
R2 Block C 13.5 15.2 32.1 -16.9 Yes R3 Clay Yard 1 7.5 15.6 32.1 -16.5 Yes R3 Clay Yard 1 4.5 15 32.1 -17.1 Yes R3 Clay Yard 1 1.5 17 32.1 -15.1 Yes R4 Clay Yard 2 7.5 11.5 32.1 -20.6 Yes	R2	Block C	10.5	13.1	32.1	-19	Yes
R3 Clay Yard 1 7.5 15.6 32.1 -16.5 Yes R3 Clay Yard 1 4.5 15 32.1 -17.1 Yes R3 Clay Yard 1 1.5 17 32.1 -15.1 Yes R4 Clay Yard 2 7.5 11.5 32.1 -20.6 Yes	R2	Block C	13.5	15.2	32.1	-16.9	Yes
R3 Clay Yard 1 4.5 15 32.1 -17.1 Yes R3 Clay Yard 1 1.5 17 32.1 -15.1 Yes R4 Clay Yard 2 7.5 11.5 32.1 -20.6 Yes	R3	Clay Yard 1	7.5	15.6	32.1	-16.5	Yes
R3 Clay Yard 1 1.5 17 32.1 -15.1 Yes R4 Clay Yard 2 7.5 11.5 32.1 -20.6 Yes	R3	Clay Yard 1	4.5	15	32.1	-17.1	Yes
R4 Clay Yard 2 7.5 11.5 32.1 -20.6 Yes	R3	Clay Yard 1	1.5	17	32.1	-15.1	Yes
	R4	Clay Yard 2	7.5	11.5	32.1	-20.6	Yes
R4 Clay Yard 2 4.5 11.5 32.1 -20.6 Yes	R4	Clay Yard 2	4.5	11.5	32.1	-20.6	Yes
R4 Clay Yard 2 1.5 14.2 32.1 -17.9 Yes	R4	Clay Yard 2	1.5	14.2	32.1	-17.9	Yes
R5 Kingsgate Primary Lower School 1 4.5 17.6 32.1 -14.5 Yes	R5	Kingsgate Primary Lower School 1	4.5	17.6	32.1	-14.5	Yes
R6Kingsgate Primary Lower School 24.519.832.1-12.3Yes	R6	Kingsgate Primary Lower School 2	4.5	19.8	32.1	-12.3	Yes
R7 Interlink House 1 4.5 21.6 32.1 -10.5 Yes	R7	Interlink House 1	4.5	21.6	32.1	-10.5	Yes
R7 Interlink House 1 7.5 21.5 32.1 -10.6 Yes	R7	Interlink House 1	7.5	21.5	32.1	-10.6	Yes
R7 Interlink House 1 10.5 21.3 32.1 -10.8 Yes	R7	Interlink House 1	10.5	21.3	32.1	-10.8	Yes
R7 Interlink House 1 13.5 20.8 32.1 -11.3 Yes	R7	Interlink House 1	13.5	20.8	32.1	-11.3	Yes
R8 73 Maygrove Road E 7.5 14.1 32.1 -18 Yes	R8	73 Maygrove Road E	7.5	14.1	32.1	-18	Yes
R8 73 Maygrove Road E 10.5 18 32.1 -14.1 Yes	R8	73 Maygrove Road E	10.5	18	32.1	-14.1	Yes
R9 73 Maygrove Road N 7.5 10.4 32.1 -21.7 Yes	R9	73 Maygrove Road N	7.5	10.4	32.1	-21.7	Yes
R9 73 Maygrove Road N 10.5 14.6 32.1 -17.5 Yes	R9	73 Maygrove Road N	10.5	14.6	32.1	-17.5	Yes
R9 73 Maygrove Road N 13.5 17.3 32.1 -14.8 Yes	R9	73 Maygrove Road N	13.5	17.3	32.1	-14.8	Yes
R10 77 Maygrove Road 1.5 13.2 32.1 -18.9 Yes	R10	77 Maygrove Road	1.5	13.2	32.1	-18.9	Yes
R10 77 Maygrove Road 4.5 16.5 32.1 -15.6 Yes	R10	77 Maygrove Road	4.5	16.5	32.1	-15.6	Yes
R10 77 Maygrove Road 7.5 18.3 32.1 -13.8 Yes	R10	77 Maygrove Road	7.5	18.3	32.1	-13.8	Yes
R10 77 Maygrove Road 10.5 18.9 32.1 -13.2 Yes	R10	77 Maygrove Road	10.5	18.9	32.1	-13.2	Yes
R11 75 Maygrove Road 1.5 17.2 32.1 -14.9 Yes	R11	75 Maygrove Road	1.5	17.2	32.1	-14.9	Yes
R11 75 Maygrove Road 4.5 23.9 32.1 -8.2 Yes	R11	75 Maygrove Road	4.5	23.9	32.1	-8.2	Yes
R11 75 Maygrove Road 7.5 23.1 32.1 -9 Yes	R11	75 Maygrove Road	7.5	23.1	32.1	-9	Yes
R12 134 Maygrove Road 1.5 9.2 32.1 -22.9 Yes	R12	134 Maygrove Road	1.5	9.2	32.1	-22.9	Yes
R12 134 Maygrove Road 4.5 13 32.1 -19.1 Yes	R12	134 Maygrove Road	4.5	13	32.1	-19.1	Yes
R12 134 Maygrove Road 7 13.8 32.1 -18.3 Yes	R12	134 Maygrove Road	7	13.8	32.1	-18.3	Yes
R13 150 Maygrove Road 1.5 5.4 32.1 -26.7 Yes	R13	150 Maygrove Road	1.5	5.4	32.1	-26.7	Yes
R13 150 Maygrove Road 4.5 9.6 32.1 -22.5 Yes	R13	150 Maygrove Road	4.5	9.6	32.1	-22.5	Yes
R14 166 Maygrove Road 1.5 8.4 32.1 -23.7 Yes	R14	166 Maygrove Road	1.5	8.4	32.1	-23.7	Yes
R14 166 Maygrove Road 4.5 8.5 32.1 -23.6 Yes	R14	166 Maygrove Road	4.5	8.5	32.1	-23.6	Yes

Table 6: Assessment of predicted noise at 1 metre from nearest receptors, night time periods

All of the predicted noise emission levels from building services plant during the night time are lower than the noise limit set by Planning Condition 28. As the negative excess is less 5 dB below background, the assessment shows compliance with condition requirements. There is predicted to be at least a 0.9 dB (A) compliance margin with the condition requirements at all locations during the night time.

CONCLUSION

This report provides a design stage noise assessment of noise emission at Liddell Road, Camden. An assessment of noise emission has been carried out to determine if the proposal comply with the requirements of condition 28.

The results of a noise surveys carried out by Gillieron Scott, Arup and NRG Consulting have been used to establish the pre-existing ambient background noise levels.

A list of the different types of building services plant proposed to be installed has been given. The VRF units on Block A roof will be fitted with acoustic enclosures and operate in night mode during 23hrs to 07hrs. The AHU in Block A plant room will be fitted with attenuators. Noise sources levels have been provided by plant manufacturers where available and presented in Appendix D.

The noise emission of each item of plant located outside or ducted to the outside has been calculated using the methodology of ISO 9613 in computational modelling software Lima Predictor V2023.

The noise emission from the combined operation of all building service plant is predicted to cause not greater than 5 dB below background, when assessed in accordance with the BS 4142: 2014 methodology.

With the proposed plant and mitigation for Block A, the noise limits of Planning Condition 28 are likely to be met in our opinion.

The information provided in this report is sufficient for the partial discharge of Planning Condition 28.



Appendix A – Product Information

VRF Outdoor Unit Noise Data





SoundPlanning Acoustic Enclosures



Notes

- Painted in any standard BS or RAL colour
- Installation Services
- Tailored Dimensions
- Insertion Loss 20dB(A)

The field test was carried out in accordance with BS EN ISO 11545-2: 1996 acoustics -Determination of sound insulation performance of enclosures. Part 2 Measurements in situ (for acceptance and verification purposes).

		SI	DUND R	EDUCT	ION			
Frequency (Hz)	63	125	250	500	1k	2k	4k	Bk
IL (to 1DP) (dB)	13	15.5	19.5	21	18.5	21	22.5	23.5



Sound Planning Limited Farnham Surrey

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AHU Specification



TECHNICAL SPECIFICATION SHEET

Project: **Quotation Reference:** Date:

Liddell Road Q12118 20 June 2023 Customer Unit Reference AHU-01 Unit Reference

Q12118-01-06

WORKING CONDITIONS		WINTER
Supply flow rate	m³/h	15516
Supply fans available static pressure	Pa	420
Extract flow rate	m³/h	14760
Extract fans available static pressure	Pa	300
Outdoor dry bulb temp.	°C	-4.0
Outdoor relative humidity	%	99.0%
Extract dry bulb temp.	°C	21.0
Extract relative humidity	%	49.9%
PERFORMANCE DATA		WINTER
Exchanger power	kW	134
Recovery efficiency (wet)	-	0.681
Available heating capacity	kW	13.6
Heating Power	kW	192
COP	W/W	9.80
SFP BS EN 13779:2007(A5)	W/(I/s)	2.259
Supply dry bulb temp.	°C	24.0
Supply relative humidity	%	34.2%
Exhaust dry bulb temp.	°C	-2.9
Exhaust relative humidity	%	98.4%
Total input power	kW	19.6
Supply fan input power ^(A2)	kW	4.84
Extract fan input power ^(A2)	kW	3.72
AIR FILTERS		
Supply prefilter		
Supply filter		ePM1 (55%)
Extract prefilter		(=)
Extract filter		ePM10 (60%)
Filter warning signal		Present
SOUND DATA		
Calculated sound power	dB(A)	94
Sound pressure ^(A3) [1.0 m]	dB(A)	47

WORKING CONDITIONS		SUMMER
Supply flow rate	m³/h	15516
Supply fans available static pressure	Pa	420
Extract flow rate	m³/h	14760
Extract fans available static pressure	Pa	300
Outdoor dry bulb temp.	°C	31.0
Outdoor relative humidity	%	50.0%
Extract dry bulb temp.	°C	24.0
Extract relative humidity	%	49.9%
PERFORMANCE DATA		SUMMER
Exchanger power	kW	69.6
Recovery efficiency (wet)		0.696
Available cooling capacity	kW	29.8
Cooling power	kW	129
EER	W/W	5.61
Supply dry bulb temp.	°C	18.0
Supply relative humidity	%	74.9%
Exhaust dry bulb temp.	°C	44.4
Exhaust relative humidity	%	22.1%
Total input power	kW	23.0
Supply fan input power ^(A2)	kW	4.84
Extract fan input power ^(A2)	kW	4.02
ELECTRICAL DATA		
Maximum input power	kW	56.3
Maximum input current	A	102
Maximum peak current	A	151
Nominal voltage supply	Ph/V/Hz	3/400/50
	2	

(A1) Ratio between the thermal gain of the inlet air and the thermal loss of the exhaust air, both referred to the external temperature, measured under dry reference conditions, with balanced mass flow and a thermal difference of the internal/external air of 20K, excluding the thermal gain generated by the fan motors and the internal leakage, in accordance with the provisions of attached V of EU Regulation No 1253/2014

(A2) Clean filter performance

(A3) Noise pressure is calculated according to the following sound propagation method: Hemispherical ISO EN 3744 source

(A4) According to EU regulation n. 327/2011

(A5) According to BS EN regulation n. 13779:2007

AHU Attenuators



Itom	Sustam Deference	Codo	Cuffin	DWC	L1 L2/ID W H Vol PD Wt M									Performance, dB							
item	System Reference	Code	Sumx	Dwg	mm	mm	mm	mm	m ³ /s	Pa	kg	Off.		63	125	250	500	1k	2k	4k	8k
1	ATT/G/01 AHU01 EXTRACT	SP	G	A02G	600		1500	1000	3.73	9	100	1	IL	4	8	12	15	20	13	11	7
2	ATT/G/02 AHU01 SUPPLY	SP	G	A02G	1500		1500	1000	3.9	22	246	1	IL	13	21	32	43	49	44	36	25
3	ATT/G/03 AHU01 INTAKE	SP	GZ211	A02G	1800		1500	1000	3.9	23	322	1	IL	14	25	36	48	51	48	41	28
4	ATT/G/04 AHU01 EXHAUST	SP	GZ311	A02G	3000		1500	1000	3.73	25	528	1	IL	19	32	46	53	55	53	51	36
5	ATT/G/05 AHU02 SUPPLY	SL	G	A02G	600		500	300	0.45	15	23	1	IL	4	8	12	16	20	15	13	7
6	ATT/G/06 AHU02 EXTRACT N	IOT REQU	JIRED	2													- -				
7	ATT/G/07 AHU02 INTAKE	SP	G	A02G	1500		500	300	0.45	25	47	1	IL	6	14	25	42	55	55	55	33
8	ATT/G/08 AHU02 EXHAUST	SP	G	A02G	1500		600	300	0.56	19	51	1	IL	6	13	24	41	55	53	51	31



Grundfos Pumps

MAGNA3

Electrical data	
Pump type	MAGNA3 (D)
Enclosure class	IPX4D (EN 60529).
Insulation class	E
Supply voltage	1 x 230 V ± 10 %, 50/60 Hz, PE.
Three digital inputs	External potential-free contact. Contact load: 5 V, 10 mA. Screened cable. Loop resistance: Maximum 130 Ω.
Analog input	4-20 mA (load: 150 Ω). 0-10 VDC (load: > 10 kΩ).
Two relay outputs	Internal potential-free changeover contact. Maximum load: 250 V, 2 A, AC1. Minimum load: 5 VDC, 20 mA. Screened cable, depending on signal level.
Bus input	Grundfos Communication Interface Modules (add-on CIM modules) for • GENIbus • LonWorks • PROFIBUS DP • Modbus RTU • GSM/GPRS • Grundfos Remote Management • BACnet MS/TP • Ethernet.
Leakage current	l _{leakage} < 3.5 mA. The leakage currents are measured in accordance with EN 60335-1.
EMC	Standards used: EN 55014-1:2006+A1:2009+A2:2011, EN 55014-2:1997+A1:2001+A2:2008, EN 61000-3-2:2006+A1:2009+A2:2009 and EN 61000-3-3:2013.
Cos φ	Terminal-connected versions have a built-in active PFC (Power Factor Control) which gives a cos φ from 0.98 to 0.99, i.e. very close to 1. Plug-connected versions have no PFC and therefore the power factor is from 0.50 to 0.99.
Consumption when the pump is stopped	4 to 10 W, depending on activity, i.e. reading the display, use of Grundfos GO, interaction with modules, etc. 4 W, when the pump is stopped and there is no activity.

Pump type	MAGNA3 (D)
Sound pressure level	≤ 43 dB(A)

DutyPoint Pumps

WX RANGE

WX2-3080-1650-AB.A

Product Description

Dutypoint Systems ScubaTANK - Combined WRAS Approved storage tank with Category 5 type 'AB' air gap and variable speed single pump booster set package. Free-standing unit comprising an insulated tank with approximately 1650 litres actual storage, stainless steel multistage submersible pump, inverter drive smart tank level control system and common fault VFC. High level alarm is included within the common fault VFC as standard. Unit also includes isolation and non-return valve and pressure vessel and a 0.75 Inch high flow failsafe close motorised inlet ball valve.





<u>Overdoor Heater</u>

DF L

3.5M MAXIMUM MOUNTING HEIGHT

Available as casing style 'F', 'R' or 'C'

Normal wid	th unit				1.0	Dm		1.5m						
Model code			DF L-10 High ou	0-W4# tput coil	DF L-10 Low ou	0-W2# tput coil	DF L-100-E#	DF L-15 High ou	0-W4# tput coil	DF L-15 Low ou	50-W2# tput coil	DF L-150-E#		
Max. Installa	ation height	m	3	.5	3	.5	3.5	3	.5	3	.5	3.5		
Optimum de	oor width	m	0	.8	0	.8	0.8	1	.3	1	.3	1.3		
Air volume	Low	m³/s	0.325		0.3	325	0.325	0.4	139	0.4	439	0.439		
	Medium	m³/s	0.416		0.4	416	0.416	0.5	570	0.5	570	0.570		
	High	m³/s	0.521		0.	521	0.521	0.	731	0.	731	0.731		
LPHW flow temperature	& return es	°C	60/40	80/60	82/71	80/60	na	60/40	80/60	82/71	80/60	na		
Heating	Low	kW	5.8	5.8 10.7 7.2 5.6		4.7/9.4	9.0	16.0	10.8	8.8	7.1/14.2			
with 20°C	Medium	kW	6.7 12.5 8.3 6.4		6.4	4.7/9.4	10.6	19.0	12.6	10.3	7.1/14.2			
entering air	High	kW	7.6	14,4	9.4	7.3	4.7/9.4	12.3	22.2	14.6	11.9	7.1/14.2		
Water flow	rate (max)	l/s	0.092	0.175	0.208	0.089	na	0.149	0.149 0.271		0.145	na		
Water press (Inc valve)	sure drop	kPa	0.6 4.3		2.4 0.5		na	1.9 6.3		6.2 1.3		na		
Electrical su	ipply		230V/1p	h/50Hz	230V/1p	oh/50Hz	400V/3ph/50Hz	230V/1	oh/50Hz	230V/1	oh/50Hz	400V/3ph/50Hz		
Rated powe	er input	kW	0.	58	0.	58	10.0	0.	77	0	.77	15.0		
Current per	phase	A	2.	52	2.	52	17.02	3.	36	3.	36	25.10		
Noise level a medium spe	dB(A)	48		4	8	48	48		2	18	48			
Weight	Model F	kg	35		3	3	37	5	0	4	17	54		
	Model R	kg	33		3	2	36	4	9	4	16	53		
	Model C	kg	38		3	6	39	5	5	Ę	52	57		

Normal widt	h unit:				2.0) m		2.5m							
Model code			DF L-20 High ou	00-W4# tput coil	DF L-20 Low ou	00-W2# tput coil	DF L-200-E#	DF L-25 High ou	50-W4# tput coil	DF L-25 Low ou	50-W2# tput coil	DF L-250-E#			
Max. Installa	tion height	m	3	.5	3	.5	3.5	3	.5	3	.5	3.5			
Optimum do	oor width	m	1.	8	1	.8	1.8	2	.3	2	.3	2.3			
Air volume	Low	m³/s	0.651		0.	651	0.651	0.7	765	0.7	765	0.765			
	Medium	m³/s	0.832		0.8	832	0.832	0.9	986	0.9	986	0.986			
	High	m³/s	1.0	43	1.0	43	1.043	1.2	53	1.2	253	1.253			
LPHW flow temperature	& return es	"C	C 60/40 80/60		82/71	80/60	na	60/40	80/60	82/71	80/60	na			
Heating	Low	kW	13.4	13.4 23.6 15.9 13.2		9.5/19.0	16.6	16.6 28.8		16.5	11.9/23.8				
with 20°C	Medium	kW	15.7 27.7 18.3 1		15.2	9.5/19.0	19.5 34.1		22.6	19.0	11.9/23.8				
entering air	High	kW	18.0	18.0 32.0 20.9 17.4 9		9.5/19.0	22.7 39.8		26.0 21.9		11.9/23.8				
Water flow r	ate (max)	I/s	0.217 0.389		0.464	0.212	na	0.273	0.484	0.579	0.267	na			
Water press (Inc valve)	ure drop	kPa	4.5 11.1		13.6 3.0		na	7.9 21.8		22.5 5.1		na			
Electrical su	pply		230V/1p	bh/50Hz	230V/1	oh/50Hz	400V/3ph/50Hz	230V/1p	bh/50Hz	230V/1	oh/50Hz	400V/3ph/50Hz			
Rated powe	r input	kW	1.15		1.	15	20.0	1.3	34	1.	34	25.0			
Current per	phase	A	5.	04	5.	04	34.02	5.	88	5.	88	42.11			
Noise level a medium spe	dB(A)	51		Ę	51	51	51		5	51	51				
Weight	Model F	kg	67		6	3	73	8	4	7	9	91			
	Model R	kg	65		e	51	71	8	31	7	6	89			
	Model C	kg	7	3	6	9	76	ę	91	8	16	95			

Add casing style 'F' or 'R' or 'C' to complete model code







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