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Technical Note

To:	Camilla Robinson (Camden and Islington NHS Foundation Trust), Tudor Jones (Cushman and Wakefield)
From:	GL Hearn Acoustics
Subject:	NHS Trust Regis Road - plant noise assessment
Reference:	GH/006504 M02A
Date:	17 August 2021

Introduction

This technical note assesses external noise emissions associated with new plant proposed to be installed at the Camden and Islington NHS Foundation Trust building at Regis Road, Kentish Town, Camden with respect to relevant planning criteria for plant noise.

Noise levels breaking into the proposed building via the façade, or compliance with any other requirements such as Health Technical Memorandum 08-01 'Acoustics' or BREEAM, are outside the scope of this assessment.

Guidance and criteria

British Standard 4142 *'Methods for rating and assessing industrial and commercial sound'* (BS 4142) describes a method for assessing noise from plant, including measuring representative background noise levels and determining a rating level for the plant noise. The following relations are made between the two values:

"NOTE 1 More than one assessment might be appropriate.

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

Appendix 3 of Camden's Local Plan states that a rating level of 10 dB below background noise levels should be the design criterion.

Existing noise climate

Noise levels were measured at positions considered to be representative of nearby noise-sensitive properties between 15:15 on Thursday 29th July and 16:00 on Thursday 5th August 2021. Contact was made with staff at the police station prior to setting up noise logging equipment to make them aware of the ongoing survey. However, measurements were interrupted and relocated because of police action and also maintenance and checks on the equipment, as well as updated information received from LB Camden during the survey period.

The survey was undertaken at the positions shown in Figure 1 and described in Table 1, approximately 1.2 metres above local ground level. The figure also indicates the proposed measurement site and surrounding environment, with existing and potential future residential noise-sensitive receptors advised by Jonathan McClue, Deputy Team Leader at LB Camden, by e-mail on 2 August 2021.

Figure 1: Proposed development in context and noise measurement positions

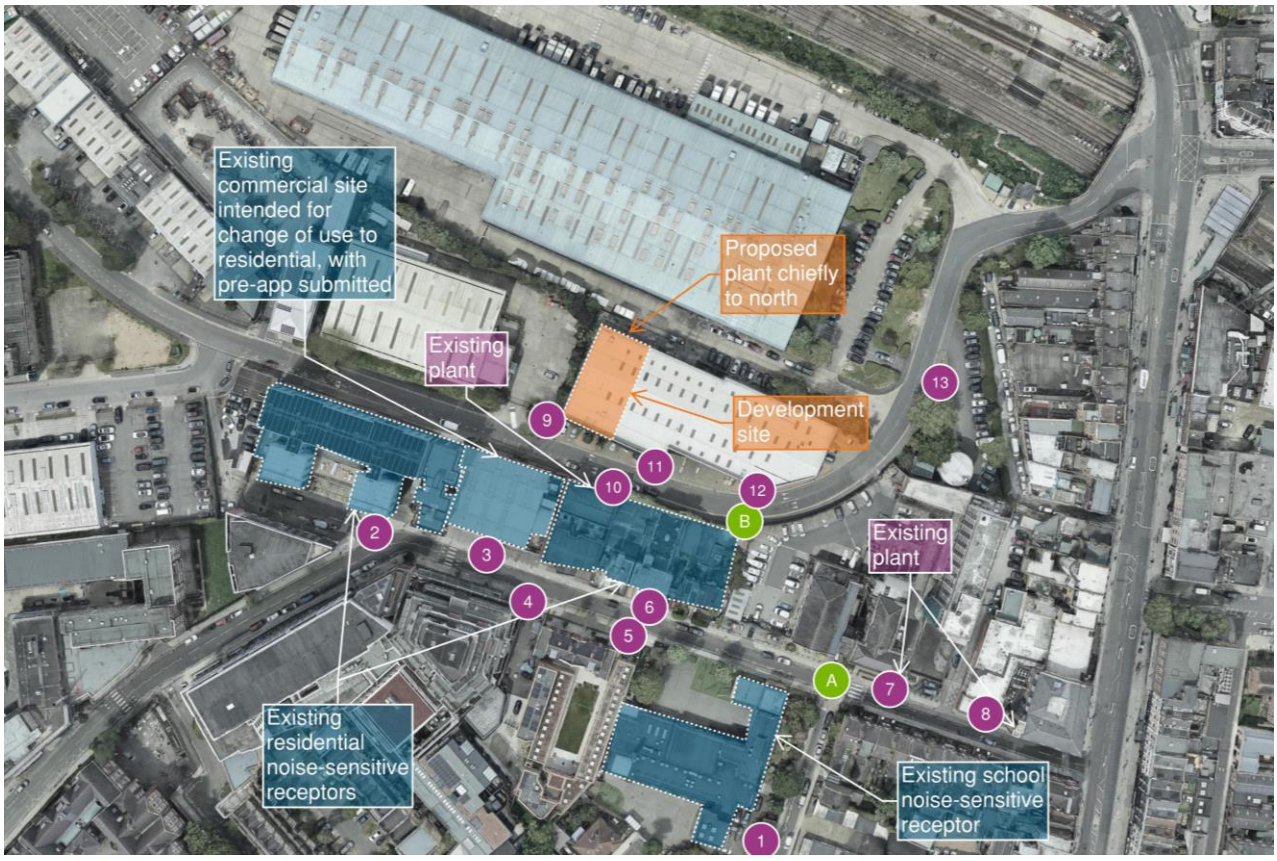

Table 1: Measurement positions

Position	Description
A	At lamppost to front of western edge of Kentish Town Police Station, Holmes Road
B	At lamppost to rear of Kentish Town Police Station, Regis Road
1	On Raglan Street entrance to St Patrick's Catholic Primary School
2	Outside Mary Brancker House student accommodation, Holmes Road

Position	Description
3	Outside 48 Holmes Road
4*	Outside Carmel Brands, Holmes Road
5*	Outside 41—43 Holmes Road
6*	Outside Acquisitions of London, Holmes Road
7*	Outside eastern edge of Kentish Town Police Station, Holmes Road
8*	To rear of McDonald's, Holmes Road
9	To south-east of development site, Regis Road
10	Outside rear of 48 Holmes Road, Regis Road
11	Outside JML House, Regis Road
12	Corner of JML House, Regis Road
13	Outside car park, Regis Road
*Short measurements of local plant	

During the daytime, noise from road traffic noise dominated much of the area. Trains could also be heard passing on the Thameslink Bedford to Brighton/Gatwick Airport route between Kentish Town and West Hampstead Thameslink stations, with approximately 4 trains per hour in each direction. Sirens and aeroplanes were occasionally noted. During occasional lulls in transportation noise, local plant could be heard.

At night, noise from existing local plant was noted to be the dominant noise source throughout much of Regis Road and Holmes Road, including those areas closest to the proposed development. The most significant items of plant are highlighted in Figure 1. On Holmes Road, these were situated to the east of Kentish Town police station, and the rear of McDonald's, Kentish Town Road, causing portions of Holmes Road to be exposed to background noise levels in excess of 50 dB L_{A90}, even at night. At Regis Road a condenser unit to the rear of 48 Holmes Road switched in and out for approximately three minutes at a time, once every five to ten minutes during the night-time measurement.

Although these elevated noise levels are present at many receptors, they have not been incorporated into the representative background noise levels so that the assessment is robust for all receptors, including those in quieter positions.

Information on survey equipment and calibration is available on request. A summary of the measured noise levels is provided in the Appendix to this technical note.

Criteria used in this assessment

The criteria in Table 2 have been developed in accordance with the principles of Appendix 3 of Camden's Local Plan.

Table 2: Proposed plant noise emission criteria at noise-sensitive receptors

Noise-sensitive receptors	Time Period	Typical measured background noise levels, dB $L_{A90,T}$*	Maximum rating level, dB $L_{Ar,Tr}$ at nearby noise-sensitive properties during normal use
Regis Road	Daytime 07:00 – 19:00	45	35
	Evening 19:00 – 23:00	44	34
	Night time 23:00 – 07:00	36	26
Holmes Road	Daytime 07:00 – 19:00	48	38
	Evening 19:00 – 23:00	48	38
	Night time 23:00 – 07:00	44	34
*T = 60 minutes during the daytime and evening; T = 15 minutes at night			

Proposed plant

Based on information provided by Capita, DP Building Services and their suppliers, the items of plant listed in Table 3 are proposed to be installed externally. We understood that these cannot be mounted on the rooftop due to structural limitations of the existing roof.

Table 3: Proposed items of plant

Type	Operation	Reference	Comments
Air handling unit x1 **FläktGroup eQ Prime-032**	Only while building is occupied	AHU01	Attenuators ATT01 and ATT02 fitted to supply and exhaust, respectively
VRF outdoor heatpumps x2 Mitsubishi PURY-P350 and/or PURY-P400	Only while building is occupied	CU01, CU02	
DX outdoor heatpumps x3 Mitsubishi PUZ-M100VKA(-ET).TH	Most used after occupation, but could run at any time	DX001, DX002, DX003	
Boosted cold water pump x1 Dutypoint **VG2-3HME05-LSM**	Intermittently, only when building is occupied	CWT01	

Table 4: Sound power level information from manufacturer, including margin

Item	Element/mode	Sound power level, dB L_W in octave band with centre frequency, Hz								Sound power level, dB L_{WA}
		63	125	250	500	1000	2000	4000	8000	
Air Handling Unit	Supply air connection	**79**	**84**	**80**	**71**	**78**	**75**	**72**	**69**	83
	Exhaust connection	**83**	**88**	**83**	**84**	**80**	**78**	**74**	**74**	86
	To surroundings	**73**	**69**	**65**	**62**	**66**	**65**	**62**	**48**	71

Table 5: Sound pressure level information from manufacturer, including margin

Item and distance	Element/mode and distance	Sound power level, dB L_P in octave band with centre frequency, Hz								Sound pressure level, dB L_{PA}
		63	125	250	500	1000	2000	4000	8000	
Air Handling Unit (@ 5 metres)	Via attenuators	-	-	-	-	-	-	-	-	≤ 55
VRF heatpumps (@ 1 metre)	P350 standard	69	64	64	62	57	52	47	40	63
	P350 low noise	55	55	51	47	43	37	36	35	49
	P400 standard	**74**	**64**	**66**	**64**	**59**	**55**	**49**	**45**	65
	P400 low noise	64	57	51	48	47	43	38	44	52
DX heatpumps (@ 1 metre)	Cooling	**60**	**58**	53	**52**	47	44	40	29	51
	Heating	60	56	**55**	51	**49**	**46**	**40**	**32**	54
Boosted cold water pump (@ 1 metre)	Overall	-	-	-	-	-	-	-	-	**58**

Table 6: Attenuator schedule from Capita

Attenuator	Insertion loss, dB in octave band with centre frequency, Hz							
	63	125	250	500	1000	2000	4000	8000
ATT01 (supply)	10	19	22	28	34	24	20	14
ATT02 (extract)	10	17	25	34	43	33	27	19

No information is available on existing plant to be removed. Any reduction in noise level as a result of removing existing plant would be beneficial and is not quantified.

The building is anticipated to be used during on weekdays only, occupied chiefly during typical office hours. Occasional out-of-hours usage is also allowed for as an exception, not to exceed 07:00 – 19:00, during which time the mechanical plant may run to preserve suitable indoor temperatures.

Assessment

As background noise levels at the nearby noise-sensitive receptors are dominated by existing plant, it is reasonable to assume that the character of noise from proposed plant will not be substantially different from the baseline context. Therefore, no penalty from BS 4142 will be applicable and the rating level ($L_{Ar,Tr}$) is equal to the specific sound level ($L_{Aeq,T}$).

Noise emissions from the AHU have been modelled using the **bold** data values in Table 4, Table 5 and Table 6.

Noise levels across the site have been predicted using CadnaA Environmental Noise Modelling Software, Version 2021. This software directly implements the methodology described in ISO 9613 for outdoor noise propagation. Expected noise levels at the position of the noise-sensitive receptors are summarised in Table 7.

Table 7: Expected combined plant noise egress levels at nearby noise-sensitive properties

Noise-sensitive receptors	Expected plant noise levels, $L_{Ar,Tr}$			Compliant with criteria
	Daytime (07:00 – 19:00)	Evening (19:00 – 23:00)	Night (23:00 – 07:00)	
Potential future residential receptors on Regis Road (Rear of 48 Holmes Road)	≤ 26 dB	≤ 23 dB	≤ 23 dB	Yes
Existing residential receptors on Regis Road	≤ 27 dB	≤ 20 dB	≤ 20 dB	Yes
Existing residential receptors on Holmes Road	≤ 12 dB	≤ 10 dB	≤ 10 dB	Yes

As there is redundancy included in the design and many items of plant run only on demand, not all plant is expected to run simultaneously under normal conditions, so noise levels are expected to be lower than those in Table 7.

Conclusion

A planning noise assessment has been undertaken against the criteria proposed in Table 2, derived from Appendix 3 of Camden's Local Plan.

Much of the mechanical plant will operate only while the building is occupied or immediately before/after, not to exceed 07:00 – 19:00. However, The DX outdoor heatpumps may run at any time.

Based on the information provided and existing noise levels measured, **combined noise emissions from all proposed plant running simultaneously are expected to comply with the relevant daytime planning criteria. Combined noise emissions from all plant to operate outside daytime hours running simultaneously are expected to comply with the relevant evening and night-time planning criteria.**

Provided the noise data included within this assessment is complied with, **the proposed mechanical plant is therefore considered to be suitable with respect to the LB Camden's planning criteria for plant noise.**

No information is available on existing plant to be removed. Any reduction in noise level as a result of removing existing plant would be beneficial and is not quantified.

If you have any queries please do not hesitate to contact me.

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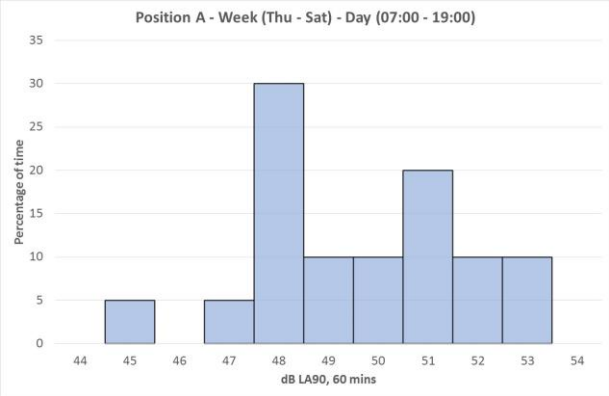
Appendix

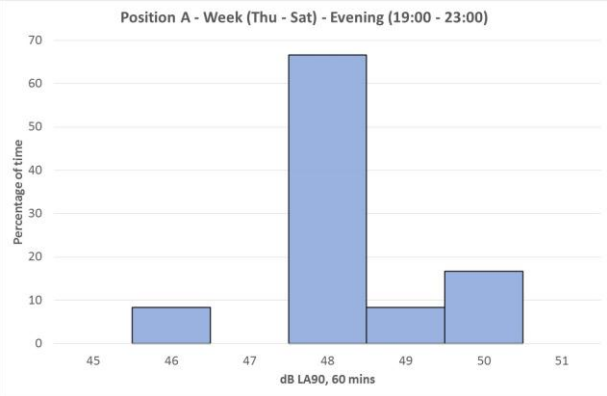
Table 8: Measured noise levels at sample positions

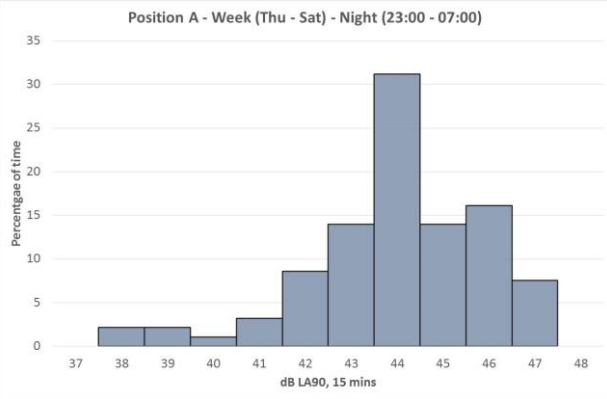
Position	Date	Start time	End time	Duration, T (h:mm)	Measured background noise level, dB $L_{A90,T}$
1	Wed 04 Aug 2021	02:40	03:10	0:30	30
2	Wed 04 Aug 2021	03:30	03:45	0:15	41
3	Wed 04 Aug 2021	03:46	03:48	0:01	42
4	Thu 29 Jul 2021	16:10	16:25	0:15	46
4	Wed 04 Aug 2021	03:48	03:50	0:02	40
5	Wed 04 Aug 2021	03:51	03:52	0:01	41
6	Wed 04 Aug 2021	03:24	03:29	0:05	37
7	Wed 04 Aug 2021	03:12	03:15	0:03	52
8	Wed 04 Aug 2021	03:17	03:19	0:02	59
9	Wed 04 Aug 2021	04:41	04:46	0:05	43
10	Wed 04 Aug 2021	03:59	04:14	0:15	37
10	Wed 04 Aug 2021	04:15	04:40	0:25	41
11	Thu 29 Jul 2021	15:32	15:47	0:15	52
12	Wed 04 Aug 2021	04:47	05:02	0:15	38
13	Thu 29 Jul 2021	15:50	16:05	0:15	47
A	Wed 04 Aug 2021	03:20	03:23	0:03	43

Figure 2: Measured background noise level histograms

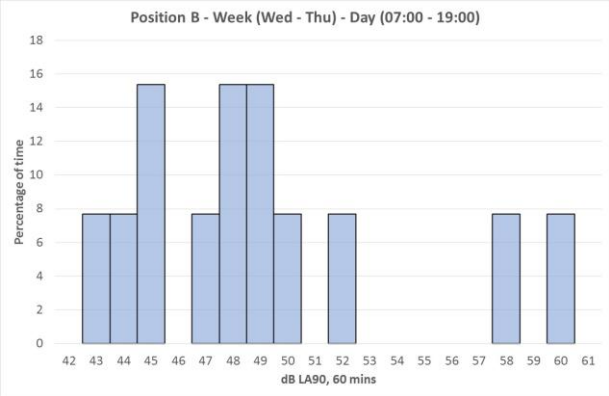
Position A

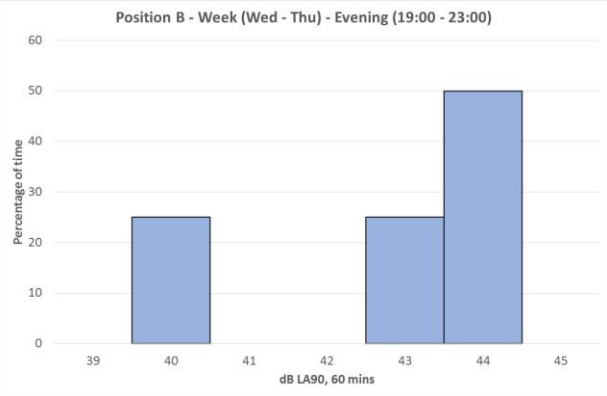






Position B





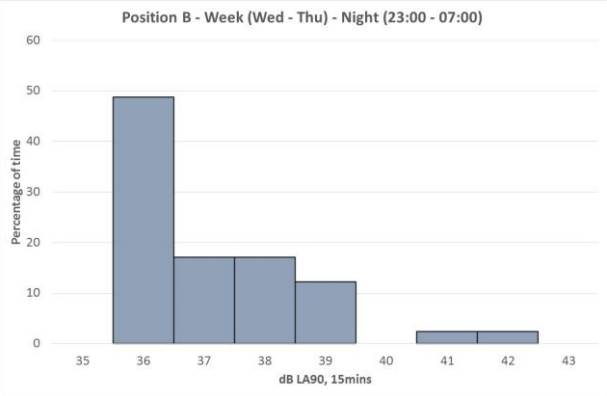


Figure 3: Measured noise level time history at Position A

Figure 4: Measured noise level time history at Position B