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ACOUSTICS PLUS

Proposed Climate Control System

Eleanor Palmer Primary School
Lupton Street, London NW5 2JA

Environmental Noise Assessment

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Environmental Noise Assessment Proposed Climate Control System	
Project Address:	Eleanor Palmer Primary School Lupton Street London NW5 2JA
Project Reference:	102479

Issue/Revision Record

Issue:	Date:	Remarks:	Author:
1	20/06/2013	First Issue	Phil Huffer

	Signature:	Print:	Title:	Date:
Author:		**Phil Huffer**	**Principal Consultant**	**20/06/2013**
Reviewer:		**Andy Dodd**	**Consultant**	**20/06/2013**

1. INTRODUCTION

1.1 Acoustics Plus Ltd (APL) is an independent firm of multi-disciplinary acoustic engineers. APL is a registered member of The Association of Noise Consultants (ANC) and the author is a corporate member of The Institute of Acoustics (IOA).

1.2 APL has been instructed by the Applicant, Eleanor Palmer Primary School, to consider and advise upon the noise implications of a proposed installation of a climate control system.

1.3 The proposed climate control system will consist of two outdoor air condenser units that will be mounted on the northern elevation of the proposed new ecospace outdoor structure.

1.4 It is understood the Local Planning Authority (LPA) require further information on noise levels from the proposed installation in order to fully assess the potential noise impact upon the surrounding neighbourhood. This report provides the response to the LPA, on behalf of the Applicant.

2. BASELINE SITUATION

2.1 The Application Site (the "site") is situated at Lupton Street, London, NW5 2JA.

2.2 The site is a one form entry (30 children per year group) state funded non-selective community primary school for ages 3 -11, in the London Borough of Camden. The site is located at the junction of Lupton Street and Raveley Street, as shown in Diagram 1.

Diagram 1

2.3 It is proposed to remove an existing nursery store and replace it with an ecospace outdoor structure (see Diagram 2).

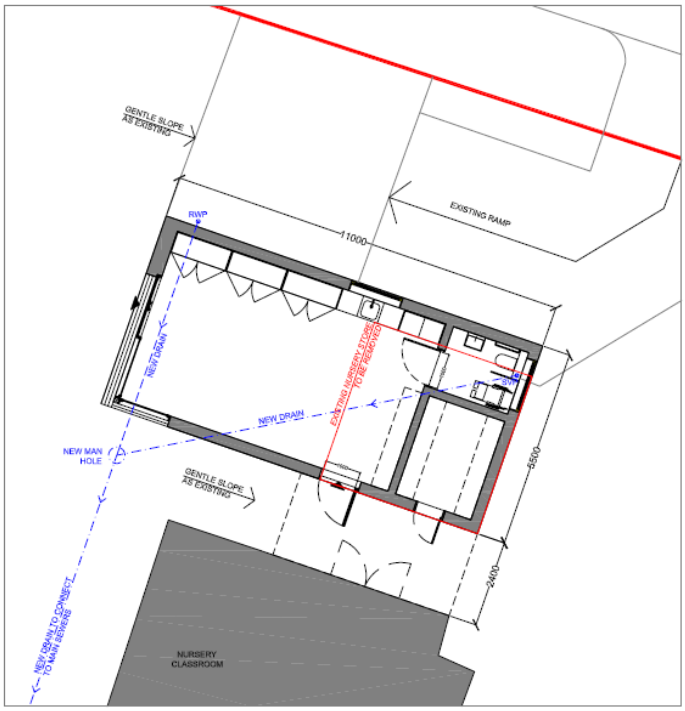


Diagram 2

2.4 As part of this proposal, it is the intention to provide mechanical climate control within the new building, which will require the installation of 2No. external air source heat pumps.

2.5 These heat pumps will be wall mounted on the northern façade of the new structure.

2.6 The nearest noise sensitive façade belongs to the first floor windows of No.1 Raveley St (as indicated on Figure 6). It should be noted that the neighbour of No.1 Raveley Street at 112 Fortress Road already has an existing wall mounted air source heat pump fixed to its front elevation (see Figure 8). The distance from the location of the nearest noise sensitive façade to the proposed location of the units was determined from laser measurements to be 22m.

2.7 Information in regard of the noise level from the air condenser units has been provided by Daikin HVAC (copy of the data sheet is provided in Appendix A). The units are itemised below:

(a) 2No. Daikin RXS35

3. NOISE OUTLINE

3.1 In order to produce an environmental noise assessment, consideration must be given to the locality of the installation.

3.2 Measurements of background noise were obtained over a 24 hour period in a courtyard adjacent to the nursery school playground. Given the dominant source of background noise (in the absence of children playing) is likely to be traffic noise from Fortress Road, this position was deemed to be reflective of background noise levels experienced at the nearest noise sensitive façade.

3.3 The particulars of the measurement exercise are recorded below:

Date:	18th – 19th June 2013
Start Time:	16:04 hrs.
Location:	courtyard adjacent to playground
Weather:	No wind, no precipitation.

3.4 The measurements carried out during the exercise are recorded below:

L_{90} percentile level (dB re 20μPa) at 15 minute intervals

3.5 The measurements obtained during the exercise are presented in Appendix B.

3.6 For the sake of clarity, the lowest measured background noise over the anticipated operational hours of the condenser units is highlighted. As the units will be utilised for climate control of a school building, it is anticipated that the operational hours will be on a demand basis during the hours 08:00-18:00hrs.

3.7 Information regarding the noise levels not to be exceeded by the installation was extracted from the LPA (London Borough of Camden) Local Development Framework 2010-2025 Section DP28 Noise and Vibration:

Table E: Noise levels from plant and machinery at which planning permission will not be granted

Noise description and location of measurement	Period	Time	Noise level
Noise at 1 metre external to a sensitive façade	Day, evening and night	0000-2400	5dB(A) <LA90
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise at 1 metre external to sensitive façade where LA90>60dB	Day, evening and night	0000-2400	55dBL_{Aeq},

3.8 The noise level of the condenser units was established from the data sheet provided (Appendix A) as follows:

(a) 2No. Daikin RXS35 @ 48dBA @ 1m (per unit)

4. EQUIPMENT

4.1 All measurements were obtained using the following equipment:

- Svantek Svan Type 948 Class 1 Serial No. 6988
- Rion Calibrator Type NC-74 Class 1 Serial No. 00410215

4.2 The relevant equipment carries full and current traceable calibration. The equipment, where necessary, was calibrated prior to and after the measurements were carried out.

5. CALCULATIONS

5.1 Given the proposed location of the condensing units, the propagation of noise from the condensing units to to the noise sensitive façade opposite has been considered. The distance from the units to the nearest noise sensitive façade was determined as 22m.

5.2 Given the manufacturers stated noise output was determined from measurements obtained in an anechoic chamber, a correction of 3dB was added to the noise output of the units. This accounted for the reflecting plane behind the units as the units are proposed to be wall mounted.

5.3 The calculation exercise can be shown in Table 1 below. The distance attenuation is based on point source propagation.

Scenario	Noise level (dBA)
1No. Daikin RXS35 unit @ 1m	48
2No. Daikin RXS35 unit @ 1m	51 [48+3]
Reflecting plane correction (+3dB)	54 [51+3]
Point source propagation over 22m	-27 [$20Log_{10}(22)$]
Predicted level at nearest façade	27 [54-27]

Table 1

5.4 In order to comply with the requirements of the LPA, any noise from the proposed installation of two condensing units should not exceed a level of 30 dBA (10dB below the lowest measured background noise over the operational hours of the units).

5.5 The lowest measured background noise level was 40dB L_{A90} that occurred during the hours 14:19 – 14:34hrs on 19th August 2011.

6. CONCLUSION

6.1 The foregoing assessment indicates that the proposed installation will meet the requirements imposed by the LPA. Further mitigation measures will not be required.

Figures

Eleanor Palmer Primary School and surrounding area

Figure 1

Figure 2

Approximate proposed location of plant (on end wall of new structure)

Figure 3

Figure 4

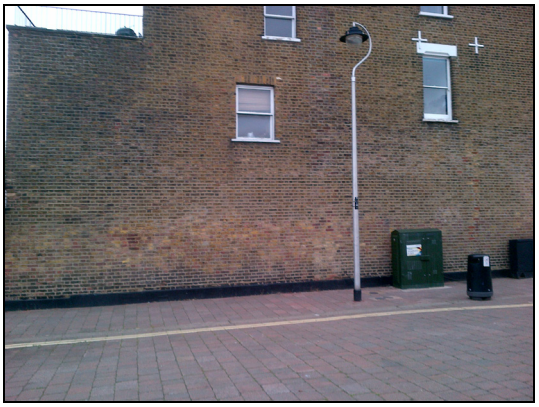


Figure 5

Figure 6

Nearest noise sensitive facade

Figure 7

Figure 8

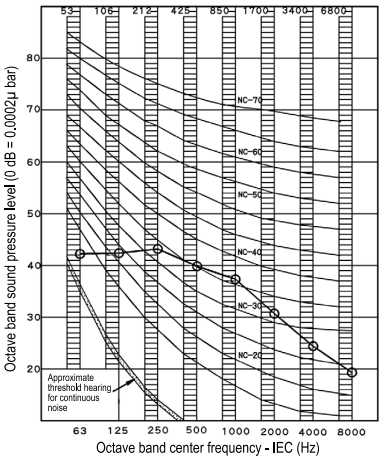
Appendix A

9 Sound data

9 - 1 Sound Pressure Spectrum

RXS20-25J2V1B

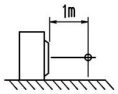
Cooling



NOTES

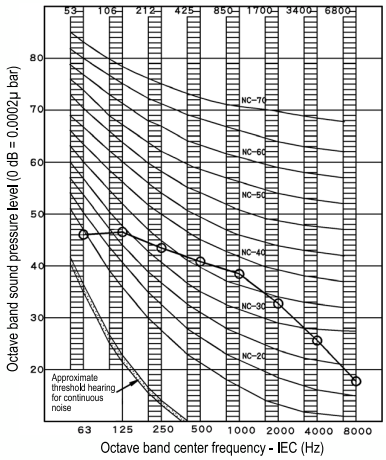
Scale	50Hz 220-240V
A	46

1 Over All (dB):
(B,G,N is already rectified)
2 Measuring place: measure in anechoic room.
3 Operating conditions: Power source 220~240V, 50Hz
4 Location of microphone.
JISC9612
The operation noise measuring method is in accordance with JISC9612



5 Cooling ○—○
6 Operation noise differs with operation and ambient conditions.

Heating



NOTES

Scale	50Hz 220-240V
A	47

1 Over All (dB):
(B,G,N is already rectified)
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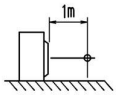
3 Operating conditions: Power source 220~240V, 50Hz
4 Location of microphone.
JISC9612
The operation noise measuring method is in accordance with JISC9612



5 Heating ○—○

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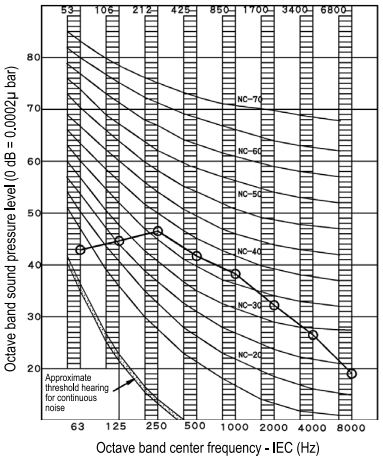
RXS35J2V1B

Cooling



NOTES

Scale	50Hz 220-240V
A	48

1 Over All (dB):
(B,G,N is already rectified)
2 Measuring place: measure in anechoic room.
3 Operating conditions: Power source 220~240V, 50Hz
4 Location of microphone.
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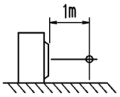

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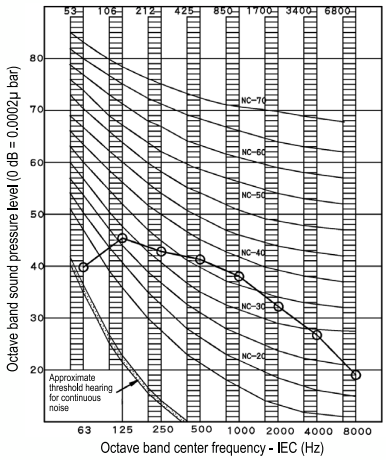
Heating



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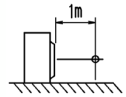

5 Heating ○—○

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Appendix B

Background noise measurements obtained at Eleanor Palmer Primary School,

Address	Time	Measurement Time	LAeq	LAmax	LAmin	LA90
1	18/06/2013 16:04	0:15:00	54	78	39	43
2	18/06/2013 16:19	0:15:00	50	78	38	42
3	18/06/2013 16:34	0:15:00	53	79	39	43
4	18/06/2013 16:49	0:15:00	54	79	38	42
5	18/06/2013 17:04	0:15:00	51	67	38	43
6	18/06/2013 17:19	0:15:00	52	82	38	42
7	18/06/2013 17:34	0:15:00	48	66	38	41
8	18/06/2013 17:49	0:15:00	50	75	38	41
9	18/06/2013 18:04	0:15:00	51	67	37	41
10	18/06/2013 18:19	0:15:00	53	70	37	41
11	18/06/2013 18:34	0:15:00	45	61	36	39
12	18/06/2013 18:49	0:15:00	51	73	35	40
13	18/06/2013 19:04	0:15:00	49	70	36	40
14	18/06/2013 19:19	0:15:00	51	69	36	41
15	18/06/2013 19:34	0:15:00	51	69	36	40
16	18/06/2013 19:49	0:15:00	51	66	36	40
17	18/06/2013 20:04	0:15:00	46	65	36	39
18	18/06/2013 20:19	0:15:00	50	69	35	39
19	18/06/2013 20:34	0:15:00	49	68	35	37
20	18/06/2013 20:49	0:15:00	51	71	34	38
21	18/06/2013 21:04	0:15:00	54	88	36	40
22	18/06/2013 21:19	0:15:00	54	73	36	39
23	18/06/2013 21:34	0:15:00	43	54	34	37
24	18/06/2013 21:49	0:15:00	46	66	35	38
25	18/06/2013 22:04	0:15:00	54	80	34	37
26	18/06/2013 22:19	0:15:00	44	57	35	38
27	18/06/2013 22:34	0:15:00	44	61	35	37
28	18/06/2013 22:49	0:15:00	51	69	34	36
29	18/06/2013 23:04	0:15:00	42	54	33	35
30	18/06/2013 23:19	0:15:00	42	56	32	34
31	18/06/2013 23:34	0:15:00	41	60	30	33
32	18/06/2013 23:49	0:15:00	40	52	31	34
33	19/06/2013 00:04	0:15:00	41	59	31	34
34	19/06/2013 00:19	0:15:00	41	53	32	34
35	19/06/2013 00:34	0:15:00	40	51	29	31
36	19/06/2013 00:49	0:15:00	39	54	30	32
37	19/06/2013 01:04	0:15:00	40	61	28	30
38	19/06/2013 01:19	0:15:00	42	66	29	31
39	19/06/2013 01:34	0:15:00	38	51	28	30
40	19/06/2013 01:49	0:15:00	39	52	29	31
41	19/06/2013 02:04	0:15:00	37	50	29	31
42	19/06/2013 02:19	0:15:00	40	61	29	30
43	19/06/2013 02:34	0:15:00	40	56	28	31
44	19/06/2013 02:49	0:15:00	39	60	29	30
45	19/06/2013 03:04	0:15:00	39	55	28	31
46	19/06/2013 03:19	0:15:00	39	53	29	31

Background noise measurements obtained at Eleanor Palmer Primary School,

Address	Time	Measurement Time	LAeq	LAmax	LAmin	LA90
47	19/06/2013 03:34	0:15:00	39	54	29	31
48	19/06/2013 03:49	0:15:00	40	55	30	33
49	19/06/2013 04:04	0:15:00	42	59	31	33
50	19/06/2013 04:19	0:15:00	42	69	30	33
51	19/06/2013 04:34	0:15:00	39	52	30	32
52	19/06/2013 04:49	0:15:00	39	55	29	32
53	19/06/2013 05:04	0:15:00	39	55	28	31
54	19/06/2013 05:19	0:15:00	43	57	31	33
55	19/06/2013 05:34	0:15:00	42	68	31	33
56	19/06/2013 05:49	0:15:00	46	64	32	34
57	19/06/2013 06:04	0:15:00	51	70	31	34
58	19/06/2013 06:19	0:15:00	49	65	34	37
59	19/06/2013 06:34	0:15:00	54	83	40	45
60	19/06/2013 06:49	0:15:00	51	63	36	41
61	19/06/2013 07:04	0:15:00	45	57	37	39
62	19/06/2013 07:19	0:15:00	49	68	39	41
63	19/06/2013 07:34	0:15:00	48	65	38	40
64	19/06/2013 07:49	0:15:00	54	83	37	40
65	19/06/2013 08:04	0:15:00	50	65	37	42
66	19/06/2013 08:19	0:15:00	55	81	36	42
67	19/06/2013 08:34	0:15:00	51	67	36	42
68	19/06/2013 08:49	0:15:00	50	65	40	43
69	19/06/2013 09:04	0:15:00	50	65	39	42
70	19/06/2013 09:19	0:15:00	52	77	40	44
71	19/06/2013 09:34	0:15:00	49	67	39	42
72	19/06/2013 09:49	0:15:00	47	64	39	42
73	19/06/2013 10:04	0:15:00	50	66	39	43
74	19/06/2013 10:19	0:15:00	50	68	39	43
75	19/06/2013 10:34	0:15:00	50	69	40	43
76	19/06/2013 10:49	0:15:00	53	76	42	45
77	19/06/2013 11:04	0:15:00	52	75	40	43
78	19/06/2013 11:19	0:15:00	49	66	39	43
79	19/06/2013 11:34	0:15:00	52	69	40	44
80	19/06/2013 11:49	0:15:00	58	90	39	42
81	19/06/2013 12:04	0:15:00	48	67	38	42
82	19/06/2013 12:19	0:15:00	49	68	39	43
83	19/06/2013 12:34	0:15:00	53	69	41	45
84	19/06/2013 12:49	0:15:00	55	76	41	46
85	19/06/2013 13:04	0:15:00	59	76	46	50
86	19/06/2013 13:19	0:15:00	54	83	40	45
87	19/06/2013 13:34	0:15:00	47	70	39	43
88	19/06/2013 13:49	0:15:00	52	70	39	42
89	19/06/2013 14:04	0:15:00	51	73	35	42
90	19/06/2013 14:19	0:15:00	52	76	36	40
91	19/06/2013 14:34	0:15:00	46	60	38	41