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**AMERESCO**

**ACLAND  
BURGHLEY  
SCHOOL, LONDON  
NW5**

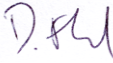

**PLANT NOISE  
ASSESSMENT**

**21 SEPTEMBER  
2022**

**1768-AF-00001-02**

**AMERESCO  
ACLAND BURGLEY SCHOOL, LONDON NW5  
PLANT NOISE ASSESSMENT**

DOCUMENT REFERENCE: 1768-AF-00001-02

<b>REVIEW AND AUTHORISATION</b>			
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<b>Approved by</b> Adrian Finn	<b>Position</b> Director	<b>Signature</b> 	<b>Date</b> 21/09/2022

<b>AMENDMENT HISTORY</b>			
<b>Issue</b>	<b>Status</b>	<b>Description</b>	<b>Date</b>
01	Draft	Report issued	23/08/2022
02	2 <sup>nd</sup> Issue	Updated calculations and mitigation recommendations	21/09/2022

<b>CONTENTS</b>	<b>PAGE NO.</b>
<b>1. INTRODUCTION</b>	<b>1</b>
1.2 Brief and Scope	1
<b>2. SITE DESCRIPTION</b>	<b>1</b>
2.1 Location	1
<b>3. GUIDANCE</b>	<b>3</b>
3.1 British Standard 4142:2014	3
3.2 Local Authority Guidance – Camden Council - Policy A4 Noise and vibration	4
<b>4. NOISE SURVEY AND MEASUREMENTS</b>	<b>5</b>
4.1 Unattended Noise Survey	5
4.2 Measurement Weather Conditions	7
4.3 Results	7
<b>5. PLANT NOISE ASSESSMENT</b>	<b>8</b>
5.1 Noise Rating Limit	8
5.2 Plant Noise Levels	8
5.3 Location of Nearest Sensitive Receptors	9
5.4 Calculated Noise Levels	9
5.5 Mitigation	10
<b>6. CONCLUSION</b>	<b>11</b>
<b>APPENDIX A – FIGURES</b>	
Figure A1 : Noise Measurement Results – Acland Burghley School	
Figure A2 : Noise Measurement Results – Acland Burghley School	
<b>APPENDIX B – TABLES</b>	
Table B1 : Calculations to 16 Ingestre Road and Music Block	
Table B2 : Calculations to Dartmouth Hill Park and Main Block	
<b>APPENDIX C – TERMINOLOGY RELATING TO NOISE</b>	
<b>APPENDIX D – LIMITATIONS TO THE REPORT</b>	

## **1. INTRODUCTION**

1.1.1 Ameresco has commissioned AF Acoustics Ltd. to undertake a plant noise assessment for the proposed installation of 4 No. Air Source Heat Pumps (ASHP) to be installed at the Acland Burghley School, London NW5 1UJ.

### **1.2 Brief and Scope**

1.2.1 The brief is to undertake a plant noise assessment for the proposed plant to be installed at the Acland Burghley School. to calculate the atmospheric noise emissions at the nearest receptors, in accordance with the requirements of Camden Council. If the proposed plant exceeds the local authority criteria, recommendations will be provided such that this can be achieved.

## **2. SITE DESCRIPTION**

### **2.1 Location**

2.1.1 Acland Burghley School is located in Tufnell Park, within the administrative jurisdiction of Camden Council.

2.1.2 The eastern school boundary is located on the well trafficked Dartmouth Park Hill. The properties in the immediate vicinity of the school are commercial on ground floor level, with residential units above. Further to the north, the properties are more residential in character.

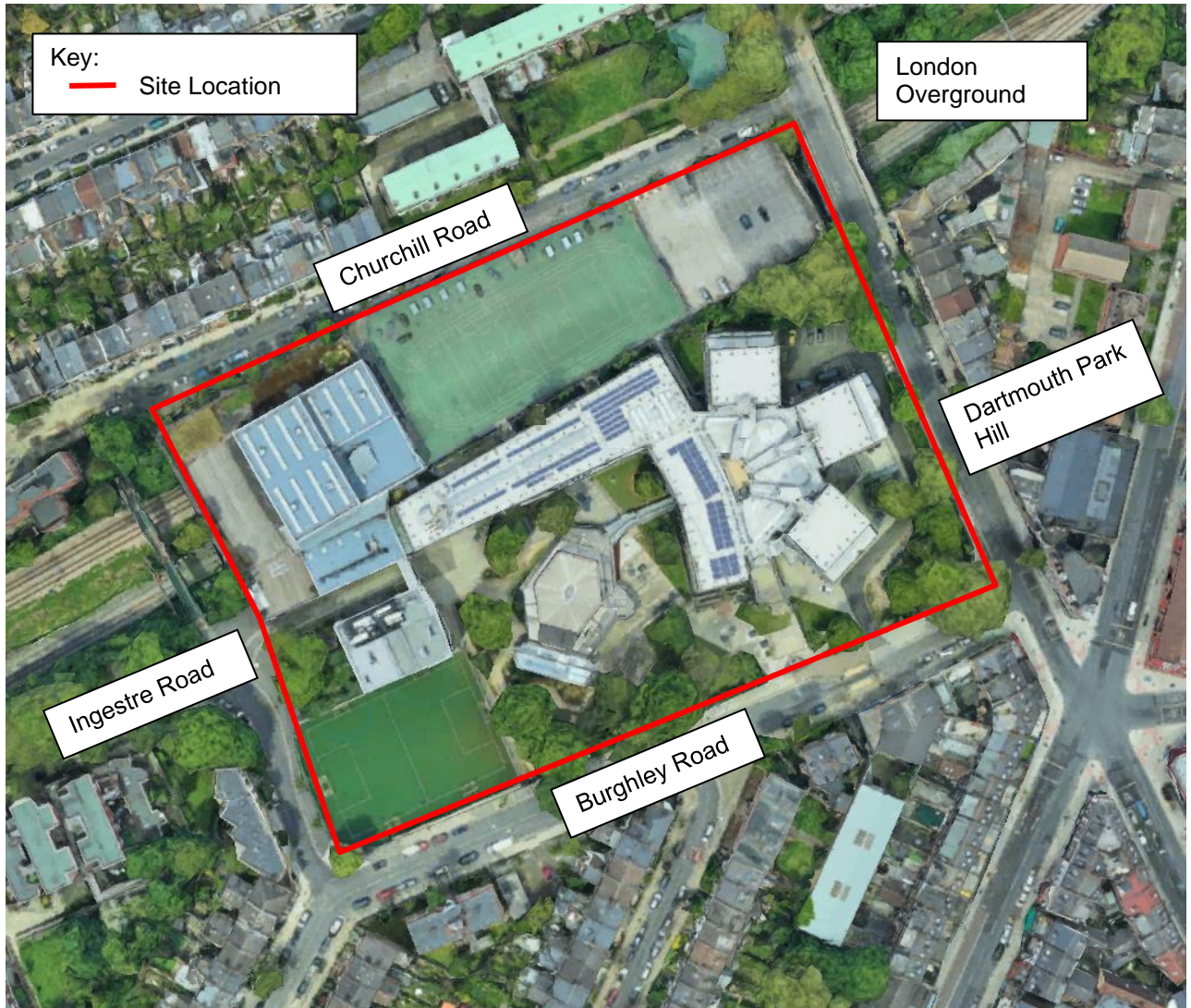
2.1.3 The school is bordered to the north by Churchill Road, along its southwestern border by Ingestre Road and along the southern boundary by Burghley Road. All of these roads are residential in character.

2.1.4 The London Overground Gospel Oak to Barking Line runs beneath the northern section of site.

2.1.5 The first ASHP units are proposed to be located along the western site boundary, close to Ingestre Road and beside the Music Block. The second ASHP installation is proposed for an area towards the eastern boundary of site, beside the Mian Block.

2.1.6 The site layout is shown in Figure 2.1.

2.1.7 The noise profile at the measurement locations consisted mainly of noise from traffic on the surrounding road network.



**FIGURE 2.1: LOCATION MAP**

### 3. GUIDANCE

#### 3.1 British Standard 4142:2014

3.1.1 BS 4142:2014 'Methods for rating and assessing industrial and commercial sound' describes methods for rating and assessing sound from "fixed installations which comprise mechanical and electrical plant and equipment", amongst other sources of noise.

3.1.2 The methodology contained within BS 4142:2014 uses outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

3.1.3 A summary of the approach set out within BS 4142:2014 is set out below:

- establish the specific sound level of the source(s);
- measure the representative background sound level, typically by measurement close to the receptor location;
- rate the specific sound level to account for any distinguishing characteristics;
- estimate the impact by subtracting the background sound level from the rating level; and
- consider the initial estimate of impact, in the context of the noise and its environment.

3.1.4 An initial estimate of the impact of the specific sound is obtained by subtracting the background sound level from the rating level. Using this approach, BS 4142 states:

*"Typically, the greater this difference, the greater the magnitude of impact  
A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context*

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

*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."*

3.1.5 Certain acoustic features can increase the significance of the impact over that expected from a basic comparison between specific sound level and the background sound level. These features include tonality and impulsivity, as well as additional characteristics and intermittency of the sound.

3.1.6 If appropriate, a subjective assessment of the plant features can be adopted. Where the plant noise contains tonal elements, the following corrections can be made depending on how perceptible the tone is at the noise receptor.

3.1.7 The specific sound level is rated to account for distinguishing characteristics by using the penalties below:

- 0 dB where the tone is not perceptible
- 2 dB where the tone is just perceptible
- 4 dB where the tone is clearly perceptible
- 6 dB where the tone is highly perceptible

3.1.8 Where the plant noise is impulsive, the following corrections can be made depending on how perceptible the impulsivity is at the noise receptor.

- 0 dB where the impulse is not perceptible
- 3 dB where the impulse is just perceptible
- 6 dB where the impulse is clearly perceptible
- 9 dB where the impulse is highly perceptible

3.1.9 For noise which is equally both impulsive and tonal, then both features can be taken into account by linearly summing the corrections for both characteristics.

3.1.10 If the plant has other distinctive characteristics, such as intermittency, then a 3 dB correction can be made.

3.1.11 If a subjective assessment is not appropriate then an objective assessment can be made. A noise source is deemed to be tonal if the time averaged sound pressure level in a one-third octave band exceeds the level in adjacent one-third octave bands by the level differences given below:

- 15 dB in the low frequency one-third octave bands (25 Hz to 125 Hz)
- 8 dB in the mid frequency one-third octave bands (160 Hz to 400 Hz)
- 5 dB in the high frequency one-third octave bands (500 Hz to 10000 Hz)

3.1.12 If an objective assessment identifies the plant noise to be tonal then a 6 dB correction must be made.

### 3.2 Local Authority Guidance – Camden Council - Policy A4 Noise and vibration

3.2.1 The Camden Local plan seeks to ensure that noise and vibration is controlled and managed. Noise and Vibration thresholds are provided, appended to the local plan documentation. The noise limits relating to industrial and commercial noise sources are reproduced below in Table 3.1.

3.2.2 The Local plan states that planning permission will not be granted for A) development likely to generate unacceptable noise and vibration impacts; or B) development sensitive to noise in locations which experience high levels of noise, unless appropriate attenuation measures can be provided and will not harm the continued operation of existing uses.

3.2.3 It is also stated that Camden will only grant permission for noise generating development, including any plant and machinery, if it can be operated without causing harm to amenity.

Existing Noise sensitive receptor	Assessment Location	Design Period	LOAEL (Green)	LOAEL to SOAEL (Amber)	SOAL (Red)
Dwellings	Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade)	Day	'Rating level' 10dB below background	Rating level' between 9dB below and 5dB above background	'Rating level' greater than 5dB above background
Dwellings	Outside bedroom window (façade)	Night	Rating level' 10dB below background and no events exceeding 57 dB L <sub>Amax</sub>	'Rating level' between 9dB below and 5dB above background or noise events between 57 dB and 88dB L <sub>Amax</sub>	'Rating level' greater than 5dB above background and/or events exceeding 88 dB L <sub>Amax</sub>

**TABLE 3.1: CAMDEN LOCAL PLAN INDUSTRIAL AND COMMERCIAL NOISE THRESHOLDS**

## **4. NOISE SURVEY AND MEASUREMENTS**

### **4.1 Unattended Noise Survey**

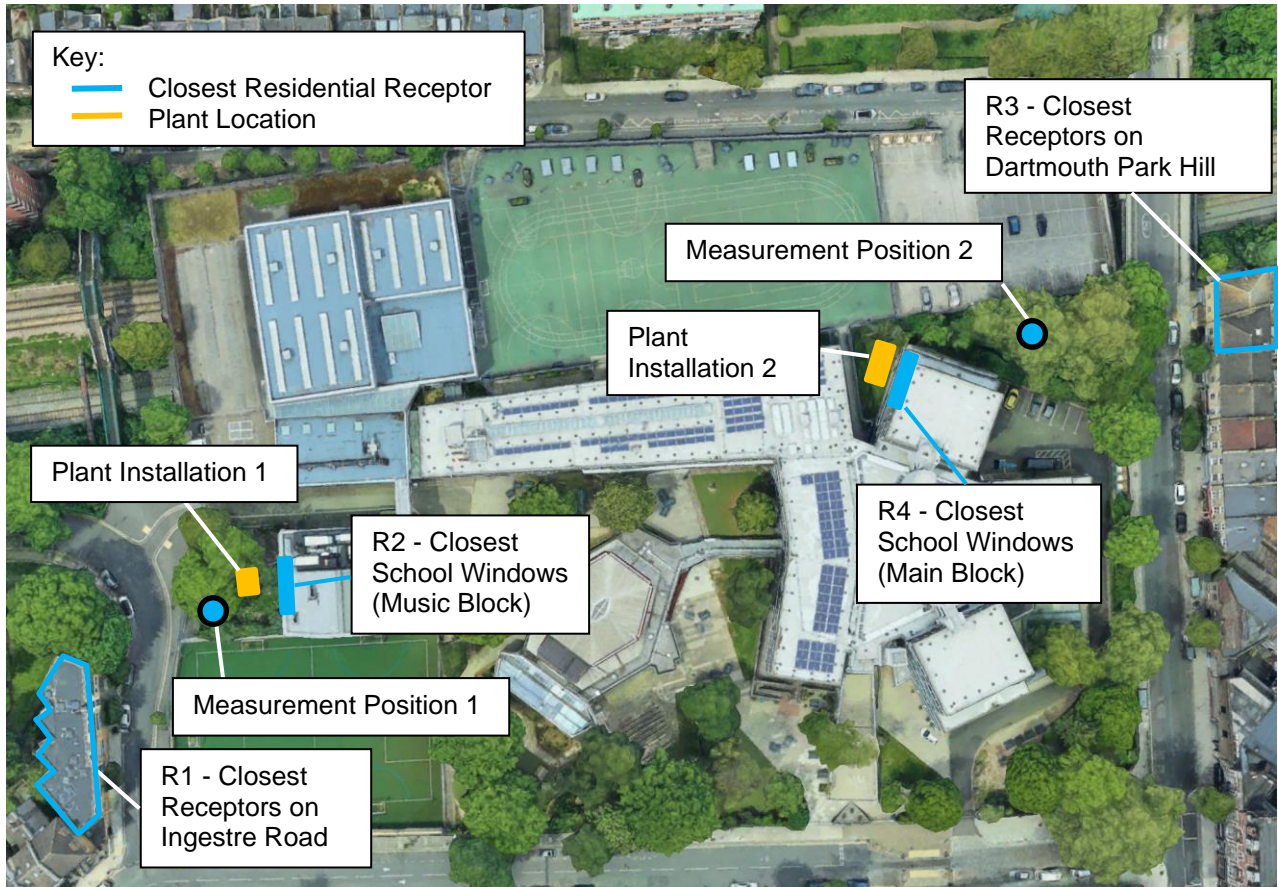
- 4.1.1 An unattended noise survey was undertaken by Daniel Flood of AF Acoustics.
- 4.1.2 The duration of the survey was between 11:45 on Monday 25 July to 12:15 on Tuesday 26 July 2022.
- 4.1.3 Measurements were undertaken in the following locations:

Position 1 – Measurements were undertaken along the southwestern site boundary, close to Ingestre Road. The microphone was mounted on a tripod at a height of 1.5m above ground level. The noise environment was determined by intermittent road traffic on Ingestre Road and traffic on the surrounding road network. This measurement position was considered representative of the noise climate as experienced at the closest residential receptors to plant installation 1. The noise levels measured in this position are considered free field.

Position 2 – Measurements were undertaken towards the eastern boundary. The microphone was mounted on a tripod at a height of 1.5m above ground level. The noise environment was determined by road traffic on Dartmouth Park Hill. This measurement position was considered representative of the noise climate as experienced at the closest residential receptors to plant installation 2. The noise levels measured in this position are considered free field.

- 4.1.4 The measurement and plant locations are shown below in Figure 4.1.
- 4.1.5 Measurements were carried out in accordance with the requirements of BS 7445-2:1991 and ISO 1996-2:1987.
- 4.1.6 The sound level meter was calibrated both prior to and on completion of the survey, with no calibration drift observed. The microphones were fitted with windshields.





**FIGURE 4.1: MEASUREMENT LOCATION**

4.1.7 The equipment used is shown in Table 4.1.

Location	Name	Serial Number	Last Calibrated
<b>Position 1</b>	NTI Audio XL2-TA Class 1 Sound Level Meter	A2A-18530-E0	January 2021
	NTI Audio MA220 Pre-amplifier	9566	January 2021
	NTI Audio MC230A Microphone	A19842	January 2021
<b>Position 2</b>	Norsonic 118 Class 1 Sound Level Meter	31382	March 2022
	Norsonic 1206 Pre-amplifier	30416	March 2022
	Gras 40AF Microphone	150690	March 2022
<b>All</b>	Larson Davis Calibrator	18295	15 December 2020

**TABLE 4.1: MEASUREMENT EQUIPMENT**

## 4.2 Measurement Weather Conditions

4.2.1 The weather during the measurements was mainly dry and clear. The temperature ranged from 14 to 22°C. Average wind speeds remained below 3 ms<sup>-1</sup>. The weather is deemed to have caused no significant effect during the measurement period.

## 4.3 Results

4.3.1 The results of the continuous noise monitoring survey are presented in graphical form in Figure A1 of Appendix A and summarised in Table 4.2.

4.3.2 The period averaged L<sub>Aeq</sub> noise levels are presented below. The L<sub>A90</sub> background noise level has been derived considering the most commonly occurring 15 minute period, whilst the L<sub>Amax,F</sub> is the maximum noise level measured.

Location	Time period	Measured Noise Levels (dB re 2.0 x 10 <sup>-5</sup> Pa)		
		L <sub>Amax,F</sub>	L <sub>Aeq,T</sub>	Typical L <sub>A90,T</sub>
Position 1 - Western Site Boundary	Daytime (07:00 – 23:00)	83	55	40
	Night time (23:00 – 07:00)	74	47	29
	School Hours (08:00 – 17:00)	83	55	44
Position 2 – Eastern Site Boundary	Daytime (07:00 – 23:00)	90	57	47
	Night time (23:00 – 07:00)	77	50	37
	School Hours (08:00 – 17:00)	90	57	47

**TABLE 4.2: SUMMARY OF UNATTENDED NOISE MEASUREMENTS**

## 5. PLANT NOISE ASSESSMENT

### 5.1 Noise Rating Limit

5.1.1 The table below presents the maximum noise rating level which must not be exceeded at the noise sensitive receptor.

	Location	Measurement Period	Assessed Background Noise Level dB L <sub>A90</sub>	Noise Rating Level Design Criteria	Plant Noise Rating Level Limit dB L <sub>A,r,Tt</sub>
Western Site Boundary	R1 - 16 Ingestre Road	24 hour	29	-10dB below the typical background noise level – at night	19
	R2 - School - Music Block	08:00 – 17:00	44	Equal to the typical background noise level during school hours	44
Eastern Site Boundary	R3 - 18 Dartmouth Park Hill	24 hour	37	-10dB below the typical background noise level – at night	19
	R4 - School – Main Block	08:00 – 17:00	47	Equal to the typical background noise level during school hours	47

**TABLE 5.1: TARGET BACKGROUND NOISE LEVEL**

### 5.2 Plant Noise Levels

5.2.1 Proposed for the western site boundary, close to the Music Block, are 2 No. Samsung AM140AXVAGH units. Proposed for the eastern side of site, close to the Main School Block are 2No. Daikin EWYT390-SRA2 units.

5.2.2 The manufacturer’s noise levels are presented in Table 5.2.

Plant	Parameter	Sound Level at Octave band Centre Frequency, dB							
		63	125	250	500	1000	2000	4000	8000
Samsung AM140AXVAGH	L <sub>p</sub> at 1m	66	64	63	62	58	51	46	38
Daikin EWYT390-SRA2	L <sub>p</sub> at 1m	76	70	69	66	64	60	57	57

**TABLE 5.2: PLANT NOISE LEVELS**

### 5.3 Location of Nearest Sensitive Receptors

#### Receptor 1 – 16 Ingestre Street

The closest residential windows with the potential to be affected by noise from the plant installation, along the western site boundary, have been identified as belonging to the second floor of 16 Ingestre Road. These are located at an approximate distance of 39m and will have direct line of sight to the plant.

#### Receptor 2 – Music Block

The closest school windows with the potential to be affected by noise from the western plant installation have been identified as belonging to the Music Block. These are located at a distance of approximately 7m, at a height of 5m

#### Receptor 3 – 18 Dartmouth Park Hill

The closest residential windows with the potential to be affected by noise from the plant installation, towards the eastern side of sight, have been identified as belonging to the second floor of 18 Dartmouth Park Hill. These are located at an approximate distance of 60m and will be partially screened by the school building from this receptor.

#### Receptor 4 – Main Block

The closest school windows with the potential to be affected by noise from the eastern plant installation have been identified as belonging to the Main Block, at an approximate distance of 2m. These windows are at an approximate height of 4.5m and will overlook the plant installation.

### 5.4 Calculated Noise Levels

5.4.1 Table 5.3 provides a summary of the calculated plant noise levels at the nearest noise sensitive receptors. The calculation sheets are presented in Appendix B.

Location	Assessment Period	Target Plant Noise Rating Level dB $L_{Ar,Tr}$	Calculated Plant Noise Rating Level dB $L_{Ar,Tr}$
R1 - 16 Ingestre Road	24 hour	19	37
R2 - School - Music Block	08:00 – 17:00	44	52
R3 - 18 Dartmouth Park Hill	24 hour	27	40
R4 - School – Main Block	08:00 – 17:00	47	69

**TABLE 5.3: PREDICTED NOISE AT NEAREST RESIDENTIAL RECEPTOR**

5.4.2 A 3dB correction for intermittency has been added to the calculated noise level at each receptor in accordance with BS4142:2014. No additional correction factors have been added for tonality etc.

5.4.3 The proposed plant installations do not meet the requirements of Camden Council at the closest residential receptor, or the proposed AF Acoustics criterion at the closest school windows.

## 5.5 Mitigation

- 5.5.1 In order to meet the requirements of Camden Council, AF Acoustics recommends the plant installation along the western site boundary is enclosed by a screen of 2.4m in height. The screen should be solid, imperforate and have a minimum surface density of 15kg/m<sup>2</sup>.
- 5.5.2 The plant items installed towards the eastern boundary of site, adjacent to the main block, should be placed within an enclosure. The enclosure should be capable of achieving the following losses:

Mitigation	Insertion Loss (dB) at Octave band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Enclosure	8	9	13	23	37	33	29	29

**TABLE 5.4: ENCLOSURE LOSSES OF PLANT INSTALLED TOWARDS EASTERN BOUNDARY**

- 5.5.3 Predicted noise levels resulting from the installation of the barrier are presented below in Table 5.5.

Location	Assessment Period	Target Plant Noise Rating Level dB L <sub>Ar,Tr</sub>	Calculated Plant Noise Rating Level dB L <sub>Ar,Tr</sub>
R1 - 16 Ingestre Road	24 hour	19	19
R2 - School - Music Block	08:00 – 17:00	44	36
R3 - 18 Dartmouth Park Hill	24 hour	27	20
R4 - School – Main Block	08:00 – 17:00	47	47

**TABLE 5.5: PREDICTED NOISE AT NEAREST RESIDENTIAL RECEPTOR – WITH MITIGATION**

- 5.5.4 The adoption of the above mitigation proposals is expected to see the plant noise levels achieve the requirements of Camden Council at the closest residential receptors to both the western and eastern plant installations, and should therefore be considered acceptable.
- 5.5.5 Meanwhile, plant noise levels at the closest school windows are predicted to achieve the proposed limits of being equal to the typical background noise levels during school hours, so should also be considered acceptable.

## **6. CONCLUSION**

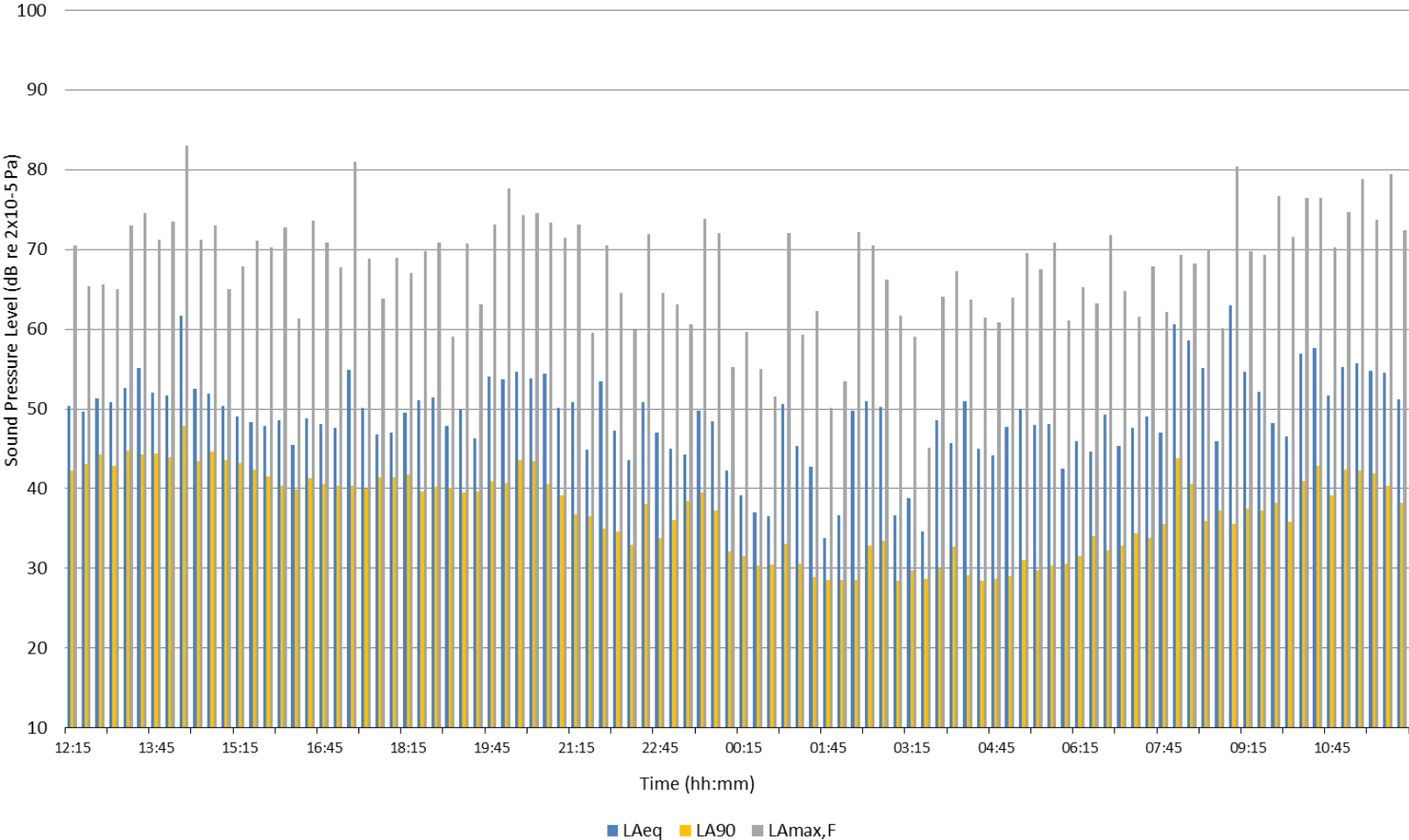
- 6.1.1 Ameresco has commissioned AF Acoustics Ltd. to undertake a plant noise assessment for the proposed installation of four Air Source Heat Pumps (ASHP) to be installed at the Acland Burghley School, London NW5.
- 6.1.2 It is proposed to install the plant in two different location. A noise survey was undertaken at Acland Burghley School at two separate locations. The monitoring locations are considered representative of the prevailing noise environment at the closest noise sensitive receptors.
- 6.1.3 Plant noise emission criteria have been set at the nearest receptor based on the results of the noise survey and in conjunction with the national and local guidance.
- 6.1.4 Noise calculations based on the plant data have been undertaken to the nearest noise sensitive receptors.
- 6.1.5 The results of the assessment have been used to assess the impact of noise from the proposed plant at the nearest noise-sensitive receptors. The calculations show that additional noise mitigation is required.
- 6.1.6 An acoustic fence/barrier is proposed for the plant installation towards the western site boundary. This should be 2.5m in height. Meanwhile, the plant items proposed towards the eastern side of site should be housed within an enclosure, with required insertion losses provided.
- 6.1.7 The adoption of the above mitigation will ensure that the predicted plant noise levels meet the requirements of Camden Council at the closest residential receptors, and should therefore be considered acceptable.
- 6.1.8 Finally, predicted plant noise levels at the closest school windows are also expected to achieve the proposed criterion.

### **AF Acoustics**

**APPENDIX A: FIGURES**

Acland Burghley School  
Position 1 - Western Site Boundary  
Time History - 25 July to 26 July 2022

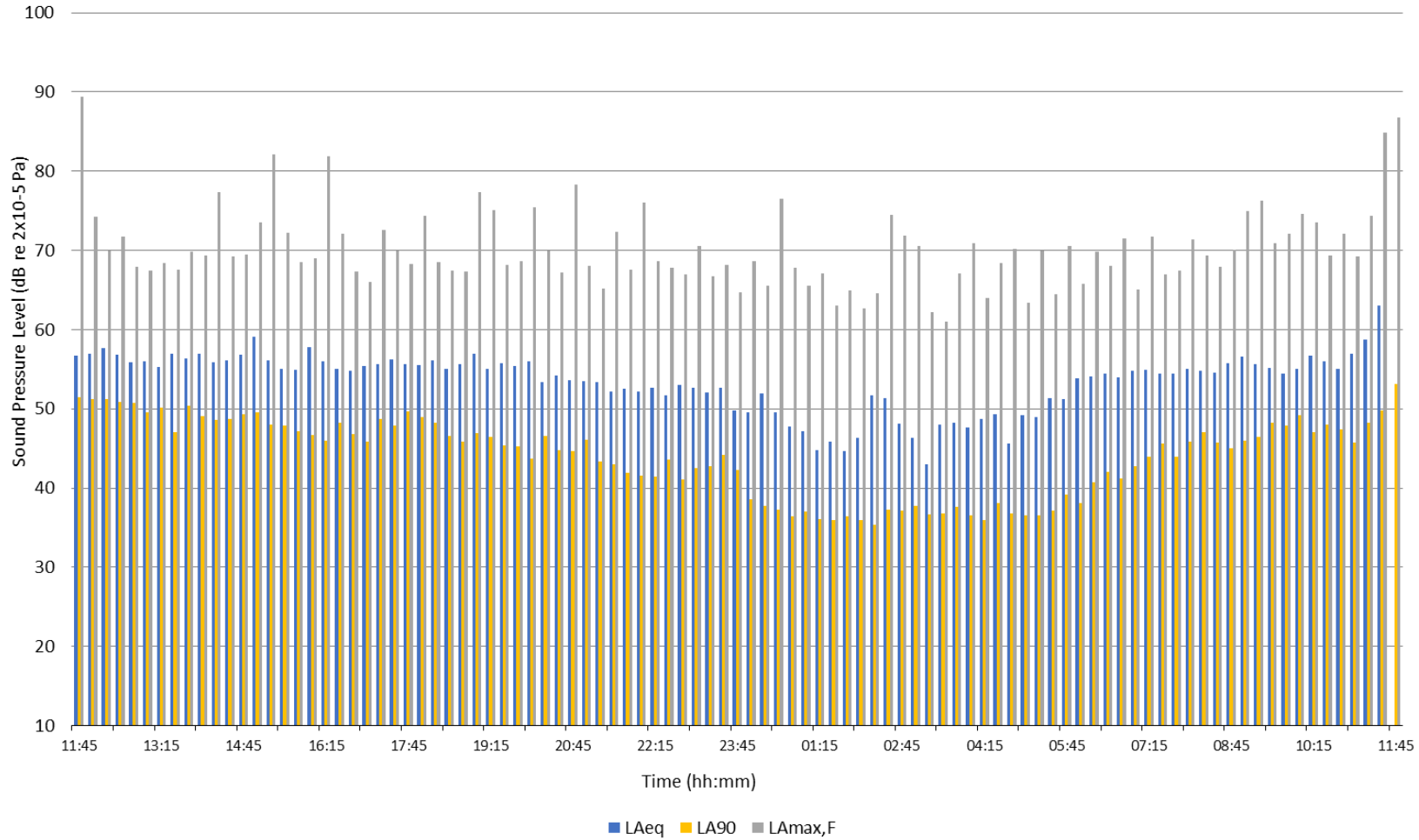
Graph 1



**FIGURE A1: NOISE MEASUREMENT RESULTS – ACLAND BURGHELY SCHOOL**

Acland Burghley School  
Position 2 - Eastern Site Boundary  
Time History - 25 July to 26 July 2022

Graph 2



**FIGURE A2: NOISE MEASUREMENT RESULTS – ACLAND BURGHELY SCHOOL**



## APPENDIX B: TABLES



Job No.	Job Title			
1768	Acland Burghley School			
Date Created	By	Date Revised	Rev	Sheet
16 Aug 2022	DF	23 Aug 2022	21	
Date Reviewed	By	Review Type	Review Status	

### Western Site Boundary Calcs - Mitigation / No Mitigation

No Mitigation Item / Description	Rating/Broadband/Input			Octave Band Centre Frequency, Hz									
	Rating	dB	dB(A)	31.5	63	125	250	500	1k	2k	4k	8k	
AM140AXVAGH				66.0	64.0	63.0	62.0	58.0	51.0	46.0	38.0		
2 units				3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Distance loss	38.5			31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	
<b>Total at 18 Ingestre Road</b>				37.3	35.3	34.3	33.3	29.3	22.3	17.3	9.3	34.2	
AM140AXVAGH				66.0	64.0	63.0	62.0	58.0	51.0	46.0	38.0		
2 units				3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Distance loss	7.0			16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	
<b>Total at School window</b>				52.1	50.1	49.1	48.1	44.1	37.1	32.1	24.1	49.0	
<b>With Mitigation</b>													
AM140AXVAGH				66.0	64.0	63.0	62.0	58.0	51.0	46.0	38.0		
2 units				3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Distance loss	38.5			31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	31.7	
Barrier 2.4m				-7.9	-9.8	-12.2	-15.1	-18.0	-21.0	-24.0	-25.0		
<b>Total at 18 Ingestre Road</b>				29.4	25.5	22.1	18.2	11.3	1.3	-6.7	-15.7	19.0	
AM140AXVAGH				66.0	64.0	63.0	62.0	58.0	51.0	46.0	38.0		
2 units				3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Distance loss	7.0			16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	
Barrier 2.4m				-6.7	-8.0	-10.0	-12.5	-15.4	-18.3	-21.3	-24.3		
<b>Total at School window</b>				45.4	42.1	39.1	35.6	28.7	18.8	10.8	-0.2	36.2	

**TABLE B1: CALCULATIONS TO 16 INGESTRE ROAD AND MUSIC BLOCK**

## Eastern Site Boundary Calcs - Mitigation / No Mitigation

Item / Description	Rating/Broadband/Input			Octave Band Centre Frequency, Hz										
	Rating	dB	dB(A)	31.5	63	125	250	500	1k	2k	4k	8k		
<b>No Mitigation</b>														
EWYT390-SRA2					76.0	70.0	69.0	66.0	64.0	60.0	57.0	57.0		
2 units					3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Distance	60.0				35.6	35.6	35.6	35.6	35.6	35.6	35.6	35.6		
<b>Total at Dartmouth Hill Park</b>					43.4	37.4	36.4	33.4	31.4	27.4	24.4	24.4	36.5	
EWYT390-SRA2					76.0	70.0	69.0	66.0	64.0	60.0	57.0	57.0		
2 units					3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Distance	2.0				6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		
<b>Total at School</b>					73.0	67.0	66.0	63.0	61.0	57.0	54.0	54.0	66.1	
<b>Mitigation</b>														
EWYT390-SRA2					76.0	70.0	69.0	66.0	64.0	60.0	57.0	57.0		
2 units					3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Distance	60.0				35.6	35.6	35.6	35.6	35.6	35.6	35.6	35.6		
Enclosure					8.0	9.0	13.0	23.0	37.0	33.0	29.0	29.0		
<b>Total at Dartmouth Hill Park</b>					35.4	28.4	23.4	10.4	-5.6	-5.6	-4.6	-4.6	17.9	
EWYT390-SRA2					76.0	70.0	69.0	66.0	64.0	60.0	57.0	57.0		
2 units					3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0		
Distance	2.0				6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0		
Enclosure					8.0	9.0	13.0	23.0	37.0	33.0	29.0	29.0		
<b>Total at School</b>					65.0	58.0	53.0	40.0	24.0	24.0	25.0	25.0	47.4	

**TABLE B2: CALCULATIONS TO DARTMOUTH HILL PARK AND MAIN BLOCK**

## APPENDIX C: TERMINOLOGY RELATING TO NOISE

<b>Sound Pressure</b>	Sound, or sound pressure, is a fluctuation in air pressure over the static ambient pressure.
<b>Sound Pressure Level</b>	The sound level is the sound pressure relative to a standard reference pressure of $20_{\mu}\text{Pa}$ ( $20 \times 10^{-6}$ Pascals) on a decibel scale.
<b>Sound Power Level (L<sub>w</sub>)</b>	is the total amount of sound energy inherent in a particular sound source, independent of its environment. It is a logarithmic measure of the sound power in comparison to a specified reference level (usually $10^{-12}$ W).
<b>Decibel (dB)</b>	A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds $s_1$ and $s_2$ is given by $20 \log_{10} (s_1 / s_2)$ . The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is $20_{\mu}\text{Pa}$ .
<b>A-weighting, dB(A)</b>	The unit of sound level, weighted according to the A-scale, which takes into account the increased sensitivity of the human ear at some frequencies.
<b>L<sub>Aeq,T</sub></b>	Equivalent continuous A-weighted sound pressure level. The value of the A-weighted sound pressure level of a continuous steady sound that, within a measurement time interval T, has the same A-weighted sound energy as the actual time-varying sound
<b>L<sub>90,T</sub></b>	L <sub>90</sub> is the noise level exceeded for 90% of the period T (i.e. the quietest 10% of the measurement) and is often used to describe the background noise level.
<b>L<sub>max,T</sub></b>	A noise level index defined as the maximum noise level during the period T. L <sub>max</sub> is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L <sub>eq</sub> noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response.
<b>Specific Noise</b>	The noise source under investigation for assessing the likelihood of complaints.
<b>Rating Level</b>	The specific noise level plus any adjustment for the characteristic features of the noise.
<b>Free field</b>	Far from the presence of sound reflecting objects (except the ground), usually taken to mean at least 3.5m.
<b>Façade</b>	At a distance of 1m in front of a large sound reflecting object such as a building façade.

## **APPENDIX D: LIMITATIONS TO THE REPORT**

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