

RESULTS OF A 24-HOUR NOISE LEVEL SURVEY CARRIED IN THREE LOCATIONS
AROUND THE HIGHGATE SCHOOL SPORTS COMPLEX
LOCATED ON BISHOPSWOOD ROAD, LONDON N6
AND A REPORT ON THE NOISE IMPACT OF THE PROPOSED NEW EXTERNAL PLANT

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Authorised for
Release by : I J Marchant

Client : Peter Deer & Associates
Project : Highgate School, North Road, London N6
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RESULTS OF A 24-HOUR NOISE LEVEL SURVEY CARRIED IN THREE LOCATIONS
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1.0. INTRODUCTION

This report details the results of three 24-hour noise surveys carried out around the existing Sports Facilities buildings operated by Highgate School. The buildings face onto Bisopswood Road and Broadlands Road in the Highgate area of London. The three surveys were carried out concurrently, over the same 24-hour period.

The locations of the microphones were as follows,

- Location A - Corner of the existing tennis court, opposite Broadlands Road.
- Location B - On boundary of the site, adjacent to No 27 Broadlands Road.
- Location C - At the rear of site next to the open spaces.

The objectives of the survey were as follows:

- To assess the proposal to install new ventilation plant into a proposed reorganisation of the buildings within the Sports Facility.
- To identify the nearest residential properties that might be affected by noise from the new plant.
- To establish the existing background noise level outside the nearest affected properties.
- To recommend noise limits and any necessary mitigating measures to ensure that the operation of the new plant does not disturb the occupants of the nearest affected properties and meets the planning directives of the local authority with regard to noise.

This report has been divided into the following sections for ease of analysis:

- 1.0. INTRODUCTION
- 2.0. SITE DESCRIPTION
- 3.0. TEST INSTRUMENTATION
- 4.0. TEST PROCEDURE
- 5.0. RESULTS AND EVALUATION OF NOISE CRITERIA
- 6.0. DISCUSSION OF RESULTS

2.0. SITE DESCRIPTION

The existing Sports Facility buildings are located on a large plot bounded by Broadlands Road and Bishopswood Road in Highgate. Residential properties exist on the other side of Broadlands Road and No 27 Broadlands Road is on the same side as the Sports Facilities and immediately adjacent to the length of the North West boundary of the site.

Photo A shows an aerial view of the site and Photos B to F show the adjacent residential properties.

3.0. TEST INSTRUMENTATION

All measurement equipment used during the survey complied with the requirements of BS4142:2014 "Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas". Details of the equipment are as follows:

Integrating Sound Level Meter: Rion type NL-52 class 1 Sound Level Meters fitted with Rion type UC-59 ½ inch condenser microphones. Serial Nos 01232570, 01232569 & 01121378

Statistical Analysis Modules: Built in module capable of computing the percentile levels LA₁, LA₁₀, LA₅₀, LA₉₀ and LA₉₉ and also the LA_{eq} level.

Acoustic Calibrator: Brüel & Kjaer type 4231 electronic calibrator. Serial No 1934160

Calibration was performed before and after the survey and was +/- 0.1 dB from the reference source.

3.1. Existing Noise Climate

Road traffic travelling on surrounding roads could be heard at the start and end of the survey, so the noise levels measured will include contributions from road vehicles.

Commercial jet aircraft were observed at medium and high altitude during the manned periods at the start and the end of the survey, so it is possible that the noise levels measured could include contributions from medium altitude jet aircraft.

There are no overland railways nearby, so the noise levels measured will not include contributions from rail noise.

Construction works were observed being carried out on one of the Sports Facility buildings in the vicinity of the location A and B microphones so the sound levels recorded at these two locations may be affected and therefore not completely typical of normal daytime background noise levels.

4.0. TEST PROCEDURE

The survey was conducted during a continuous 24-hour period from 8:21 am on Monday the 6th of June 2022 to 8:44 am on Tuesday the 7th of June 2022.

Data was continuously acquired throughout the measurement period with the individual averaging time for statistical noise data set to 15 minutes. The following 'A' weighted statistical measurements were recorded concurrently: -

- LA₁ - The Sound Pressure Level exceeded for 1% of the measurement period.
- LA₁₀ - The Sound Pressure Level exceeded for 10% of the measurement period.
- LA₅₀ - The Sound Pressure Level exceeded for 50% of the measurement period.
- LA₉₀ - The Sound Pressure Level exceeded for 90% of the measurement period. LA₉₀ is considered to represent the "background noise level" during the measurement period and is used for the assessment of noise to determine the likelihood of complaints (See BS 4142:2014).
- LA₉₉ - The Sound Pressure Level exceeded for 99% of the measurement period.
- LA_{eq} - The continuous steady state Sound Pressure Level that has the same acoustic energy as the real fluctuating level.

4.1. Measurement Positions

The microphones were mounted on booms (locations A and B) and a tripod (location C) and positioned on the corner of the fence around the tennis court, on the boundary fence next to the front of No 27 Broadlands Road and at the rear of the site opposite the open grassed area behind the site. The microphones were all oriented vertically and were approximately 3m above ground level at locations A and B and 1.2m above ground level at location C. The locations of the microphones can be seen on the attached Photos A, B, G, H and I.

Location A - On the corner of the existing tennis court, opposite Broadlands Road.

Location B - On the North West boundary of the site, adjacent to No 27 Broadlands Road.

Location C - At the rear of site next to the bottom of the garden of No 27 Broadlands Road.

All of the microphones were connected by low impedance cables to their associated instrumentation which was contained within individual weatherproof housings.

4.2 Weather Conditions

The weather conditions prevailing during the measurement period were in line with those recommended in BS 4142:2014: -

Weather daytime: -	Clear	Weather night time: -	Clear
Wind daytime: -	Calm	Wind night time: -	Calm

The microphones were protected during the survey by acoustically transparent wind balloons.

5.0. RESULTS AND EVALUATION OF NOISE CRITERIA

The raw test data, gathered during the noise survey, is given in Appendix 'A' of this report.

The 'A' Weighted L_{eq} levels measured over each 15 minute interval throughout the 24-hour period, denoted by LA_{eq} , (15 mins), are displayed as bar graphs on the attached Sketches No QF/10731/T1, -/T3 and -/T5 at the back of this report.

The 'A' Weighted percentile levels measured over each 15 minute interval throughout the 24-hour period, denoted by LA_{10} (15 mins), LA_{50} (15 mins) and LA_{90} (15 mins) are displayed as line graphs on the attached Sketches No QF/10731/T2, -/T4 and -/T6 at the back of this report.

5.1. Summary of Results

The table QF/10731/D1 below summarises the noise levels taken over the 24-hour period in terms of the maximum and minimum Sound Pressure Levels recorded.

Table QF/10731/D1 – Summary of Maximum and Minimum Noise Levels

	Location	LA_{eq}	LA_1	LA_{10}	LA_{50}	LA_{90}	LA_{99}
Minimum	A	33dBA	35dBA	34dBA	32dBA	31dBA	31dBA
	B	43dBA	44dBA	43dBA	42dBA	42dBA	42dBA
	C	36dBA	38dBA	37dBA	36dBA	35dBA	35dBA
Maximum	A	70dBA	78dBA	76dBA	57dBA	51dBA	51dBA
	B	69dBA	83dBA	74dBA	57dBA	52dBA	51dBA
	C	80dBA	93dBA	83dBA	71dBA	65dBA	62dBA

The table QF/10731/D2 below states the minimum LA₉₀ noise levels recorded during the time periods of 7.00am to 23.00pm (Daytime / Evening) and 23.00pm and 7.00am (Night time)

Table QF/10731/D2 – Minimum LA₉₀ Noise Levels – Daytime/Evening and Night time

	Location	Minimum LA ₉₀
Daytime/Evening (7am to 11pm)	A	31dBA
	B	42dBA
	C	36dBA
Night Time (11pm to 7am)	A	31dBA
	B	42dBA
	C	35dBA

5.2. Summary of the Local Authority's planning requirements regarding noise for noise sensitive properties

The local planning authority is the London Borough of Haringey.

Haringey Council publishes a Sustainable design and construction supplementary planning document which was adopted in March 2013. Section 7.2 of this document, 'Noise', reads as follows:-

Mechanical systems should only be used as a complement to natural ventilation to ensure a constant standard of indoor air quality. Systems should not create a noise nuisance and should be efficient, where possible including technology to recover heat energy for other uses. Where mechanical systems are used, careful consideration will need to be given to ensure air intakes are positioned appropriately. Mechanical ventilation should be designed to ensure no noise nuisance is caused to occupiers of other properties and that noise disturbance does not affect the property in which ventilation is situated.

Section 7.2 of the same document also stipulates the use of BS 4142:1997 "Method for rating industrial noise affecting mixed residential and industrial areas".

The Mayors Ambient Noise Strategy, under section 4E.11, describes two main goals of industrial noise control:

...avoiding exceeding desirable absolute noise levels, such as set out in guidelines produced for the World Health Organisation, PPG24 and BS 8233; and avoiding noise which is considered likely to give cause for complaint, as set out in BS 4142:1997.

We propose that to satisfy the criteria of the local authority, any plant, machinery or equipment should not lead to an increase in the existing background noise levels. In order for there to be no increase in ambient noise levels the maximum external noise level, emitted by any plant, machinery or equipment should be at least 10dB below the lowest existing LA₉₀ background noise level during the period of the plants normal operation. This noise level should not be exceeded at a position 1 metre from any neighbouring residential property.

For tonal or intermittent noise, a 5dB correction should be added, leading to a total of 15dB below the existing LA₉₀

5.3. Determination of noise sensitive property design criteria

We believe that the sound produced by the new plant will not be intermittent or contain tones. Based on the local authority's planning requirements outlined above, the new plant should therefore be designed to be 10dB below the minimum existing LA₉₀ background noise level during the relevant operational period of the plant.

The lowest recorded LA₉₀ noise levels measured during the 24 hour survey period are given in Table QF/10731/D2 above.

any plant should therefore be designed to achieve the following noise levels, if the plant is to be operated on a 24 hour basis,

Location A - 21dBA
 Location B - 32dBA
 Location C - 25dBA

and the following noise levels, if operated during the daytime hours of 7am to 11pm.

Location A - 21dBA
 Location B - 32dBA
 Location C - 26dBA

The above noise levels should be achieved at 1m from the nearest noise sensitive window.

5.4. Summary of external noise criteria

Based upon the lowest measured LA₉₀ background noise levels during the survey and the Council's requirements outlined above we summarise the design rating levels to be adopted for this project in table QF/10731/D3: -

Table QF/10731/D3 – recommended design rating levels L_{Ar,T}

Type of premises	Location	L _{Ar,T} (24 hour)	L _{Ar,T} (7am - 11pm)
Noise sensitive	A	21dBA	21dBA
	B	32dBA	32dBA
	C	25dBA	26dBA

6.0. DISCUSSION OF RESULTS

It is proposed to build a new Sports Hall on the left hand side of the site and upgrade the existing sports Hall on the right hand side of the site.

The layout of the new buildings is shown on the attached Ed Toovey drawings No 1182/GA/011 and -/012 which are attached to this report in Appendix B. These drawings have been added to by Peter Deer and Associates under their SK220425ac2 and ac3 additions, dated the 9th of March 2022. These drawings show the location of five ventilation Air Handling Units and twelve air source heat pump units in two locations. Nine ASHP units are located between the existing Sports hall and the existing Swimming Pool and the remaining three ASHP units are located to the rear of the new Sports Hall building immediately opposite the boundary fence to No 27 Broadlands Road.

The table QF/10731/D4 below lists the Sound levels of these machines and the natural and required attenuation in order to achieve the daytime/evening limiting noise levels listed in Table QF/10731/D3 above.

Table QF/10731/D4 – Noise levels of the Air Handling Units and ASHP units proposed and the Natural and Required Attenuation to 1 metre from the windows of the house at 27 Broadlands Road

Unit/Attenuation	Sound Pressure Level (dB ref $2 \times 10^{-5} \text{ N/m}^2$)								dBA
	63	125	250	500	1k	2k	4k	8k	
Fresh Air to Flakt AHU – SWL	61	69	64	60	52	49	45	42	20
SWL to SPL	-8	-8	-8	-8	-8	-8	-8	-8	
Reverberation of buildings	+6	+6	+6	+6	+6	+6	+6	+6	
Distance Loss – $20\log 17$	-24	-24	-24	-24	-24	-24	-24	-24	
Emtec RAAC/25/600 silencer	-6	-9	-15	-27	-34	-34	-31	-28	
Resultant SPL at 1m from window	29	34	23	7	-	-	-	-	
Exhaust Air from Flakt AHU – SWL	78	81	77	77	74	69	66	65	27
SWL to SPL	-8	-8	-8	-8	-8	-8	-8	-8	
Reverberation of buildings	+6	+6	+6	+6	+6	+6	+6	+6	
Distance Loss – $20\log 17$	-24	-24	-24	-24	-24	-24	-24	-24	
Emtec RAAC/25/900LFC silencer	-9	-14	-21	-33	-40	-40	-36	-33	
Resultant SPL at 1m from window	43	41	30	18	6	3	4	6	
Mitsubishi CAHV-P500YB-HPB – SPL at 1 metre free field	70	65	61	57	52	47	49	44	31
3 off units	+5	+5	+5	+5	+5	+5	+5	+5	
Reverberation off building	+3	+3	+3	+3	+3	+3	+3	+3	
Distance correction – 10m ($10\log A_9/A_1$)	-14	-14	-14	-14	-14	-14	-14	-14	
Acoustic Treatment–Emtec WCAC30 cladding + inlet RAAC/33/900LF + outlet PAC30 plenum silencers	-11	-16	-24	-32	-42	-44	-42	-30	
Resultant SPL at 1m from window	53	43	31	19	4	-	1	8	
Overall SPL at 1m from window	54	45	34	21	8	3	5	10	32

The above calculations show that by fitting Emtec RAAC25 silencers onto the fresh air inlet and exhaust air outlet of the Flakt Air Handling Units and by fitting Emtec RAAC/33/900LF inlet and Emtec vPAC30 outlet silencers onto the three Mitsubishi air cooled condensers a noise level of no more than 32dBA can be achieved at 1 metre from the windows of the neighbouring residential property at 27 Broadlands Road

The layout of the attenuation to the Heat Recovery units is shown on the attached sketch No QF/10731/GA1.

The other Air Handling Units, which are further away from the windows of 27 Broadlands Road and are shielded from those windows by the central Sports Complex Building, should be fitted with the same attenuation as this will ensure that the noise level in the rear garden of 27 Broadlands Road is not affected by the new ventilation systems.

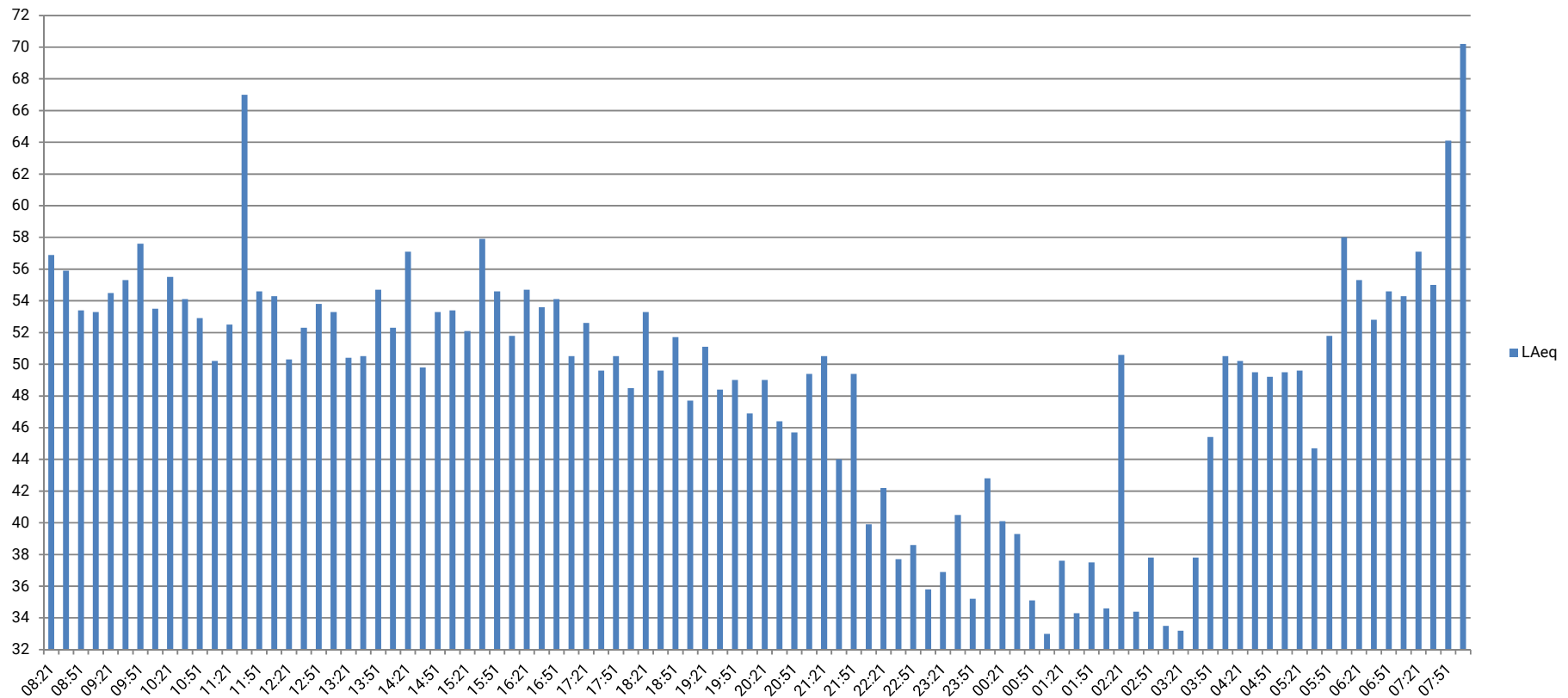
If the above attenuation is fitted to the new plant the limiting LAeq noise level at 1 metre from the windows of the house at 27 Broadlands Road will not exceed 32dBA and will allow 24 hour operation of the new plant.

The nine Heat pump condensers on the level 3 roof between the central and right hand Sports Complex building are some 60 metres from the rear of 27 Broadlands Road and 56 metres from the nearest residential property in Bishopswood Road. The units will be shielded from direct line of sight to the property in Broadlands Road by the Sports Complex buildings and will therefore have a noise level some 10dB less than the 31dBA limiting noise level. However the nine condensers may have a direct line of sight to the nearest residential property in Bishopswood Road and if this so then the noise level, due to these condensers, will be some 10dB above the limiting Leq level of 21dBA at the front of the site.

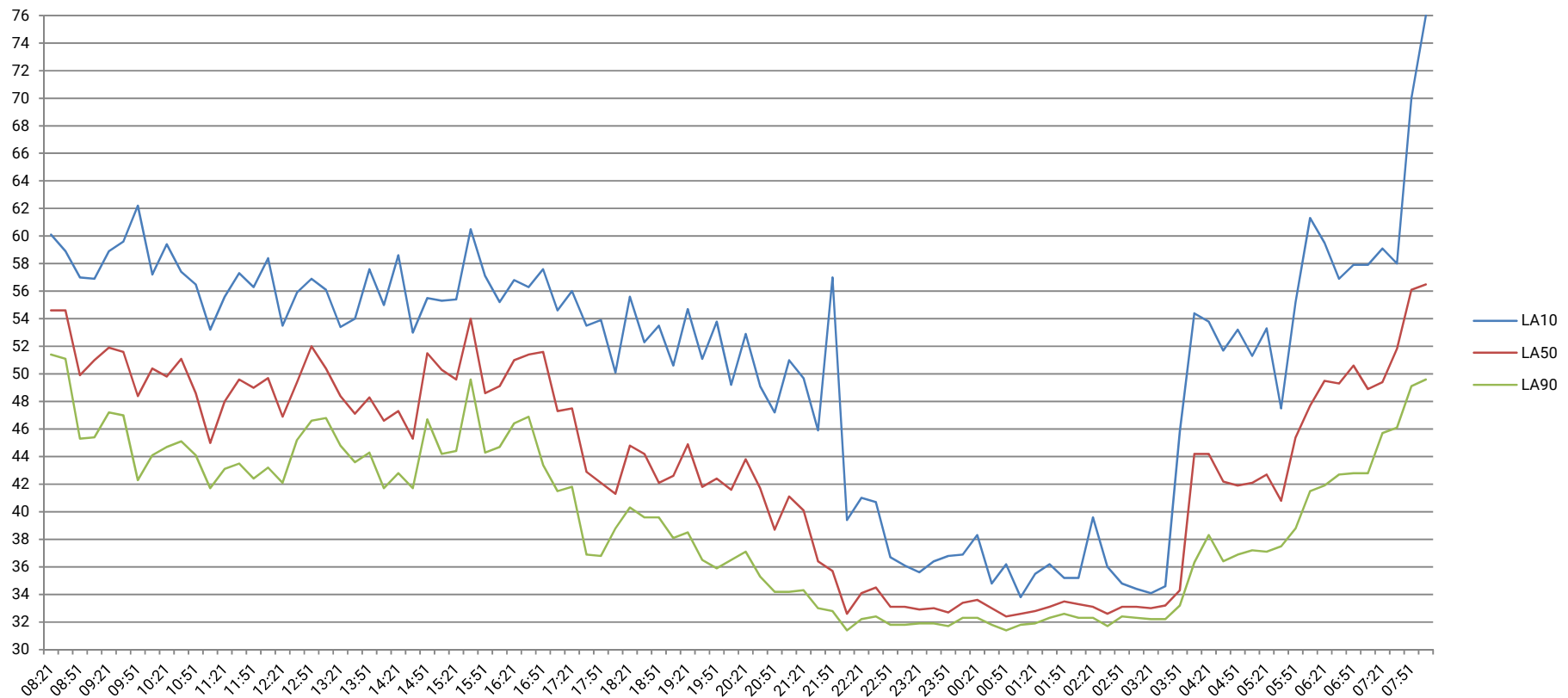
In order to attenuate this level below 21dBA an Emtec LAAC15-105 acoustic louvred screen should be erected in front of the condensers. The acoustic louvred screen should be at least 300mm higher than the height of the condensers.

If the above recommendations are followed the design will meet the planning requirements of the local council and will ensure that no justifiable complaints should be received from the neighbours under the guidelines of BS4142:2014.

Emtec Products Ltd
27th June 2022



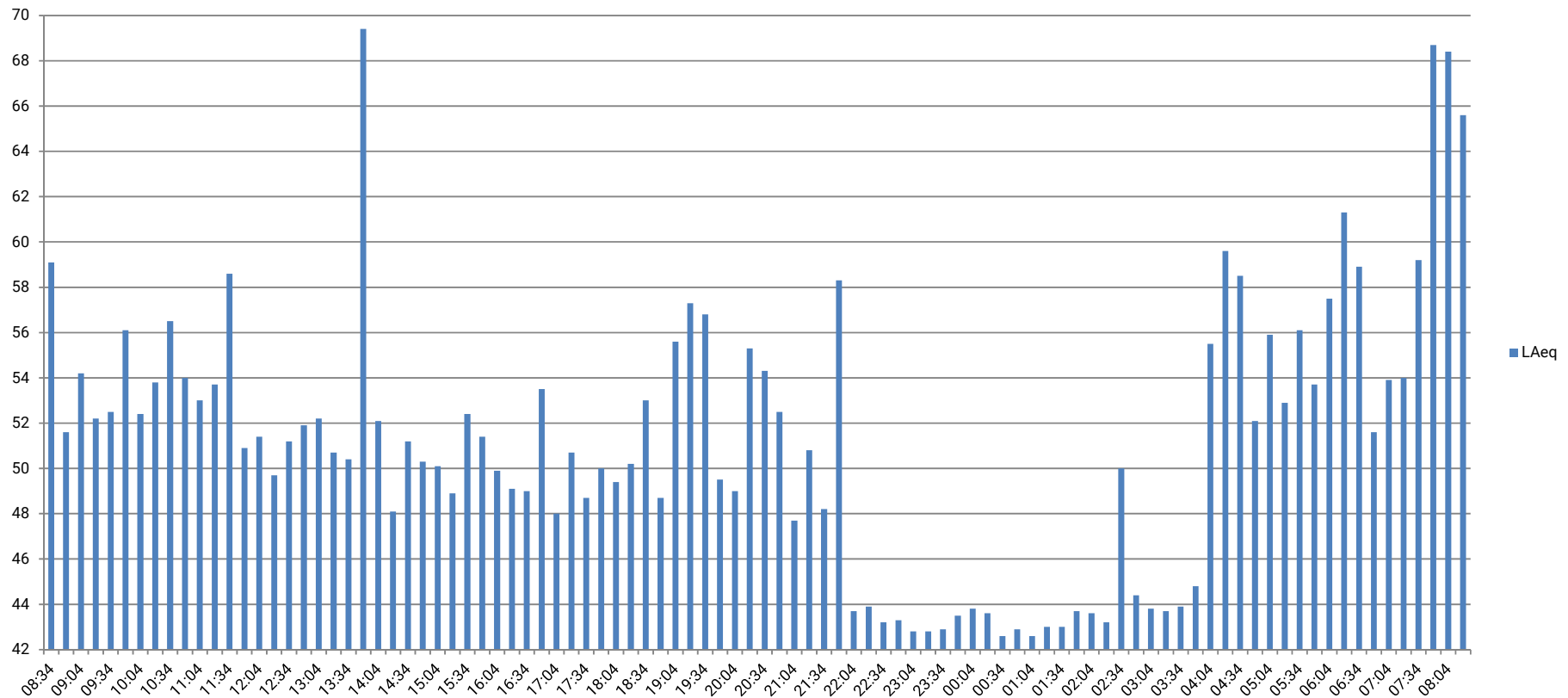
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CLIENT: Peter Deer & Associates	PF No: 7185				APPROVED BY: MGR		REVISION								
PROJECT: Highgate School, North Road, London N6	Q	A	M	I	DESIGN AUTH: MGR		SKETCH No. QF/10731/T1								



TITLE: LA10; LA50 & LA90 Levels (Location A)		ISSUE DATE: 15th June 2022				DRAWN BY: MGR		A	B	C	D	E	F	G	H
CLIENT: Peter Deer & Associates		PF No: 7185				APPROVED BY: MGR		REVISION							
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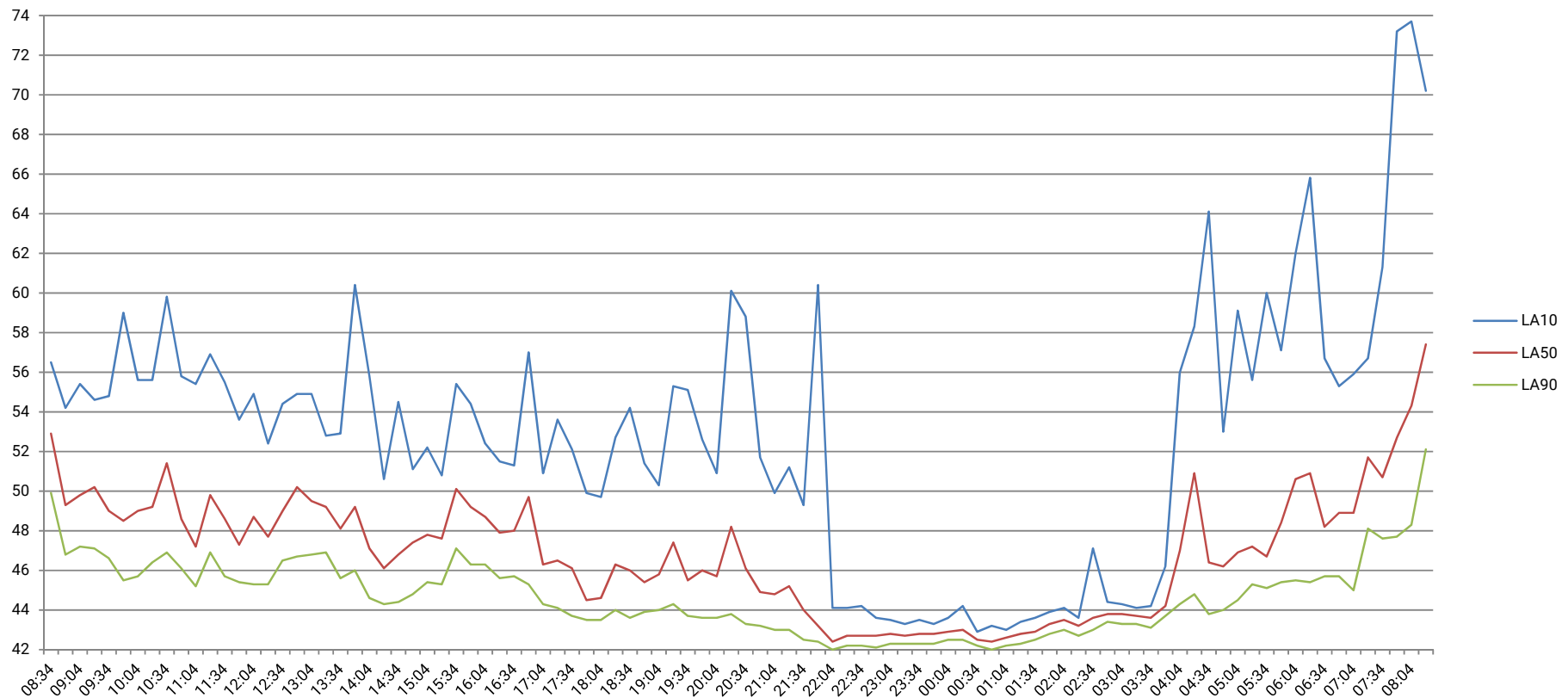
Unit L, Turnpike Way, High Wycombe,
Buckinghamshire, HP12 3TF
Telephone: 020 8848 3031
www.emtecproducts.co.uk



TITLE: <i>LAeq Levels (Location B)</i>	ISSUE DATE: 15th June 2022				DRAWN BY: MGR				A	B	C	D	E	F	G	H
	CLIENT: Peter Deer & Associates				PF No: 7185				REVISION							
	PROJECT: Highgate School, North Road, London N6				Q	A	M	I	DESIGN AUTH: MGR				SKETCH No. QF/10731/T3			



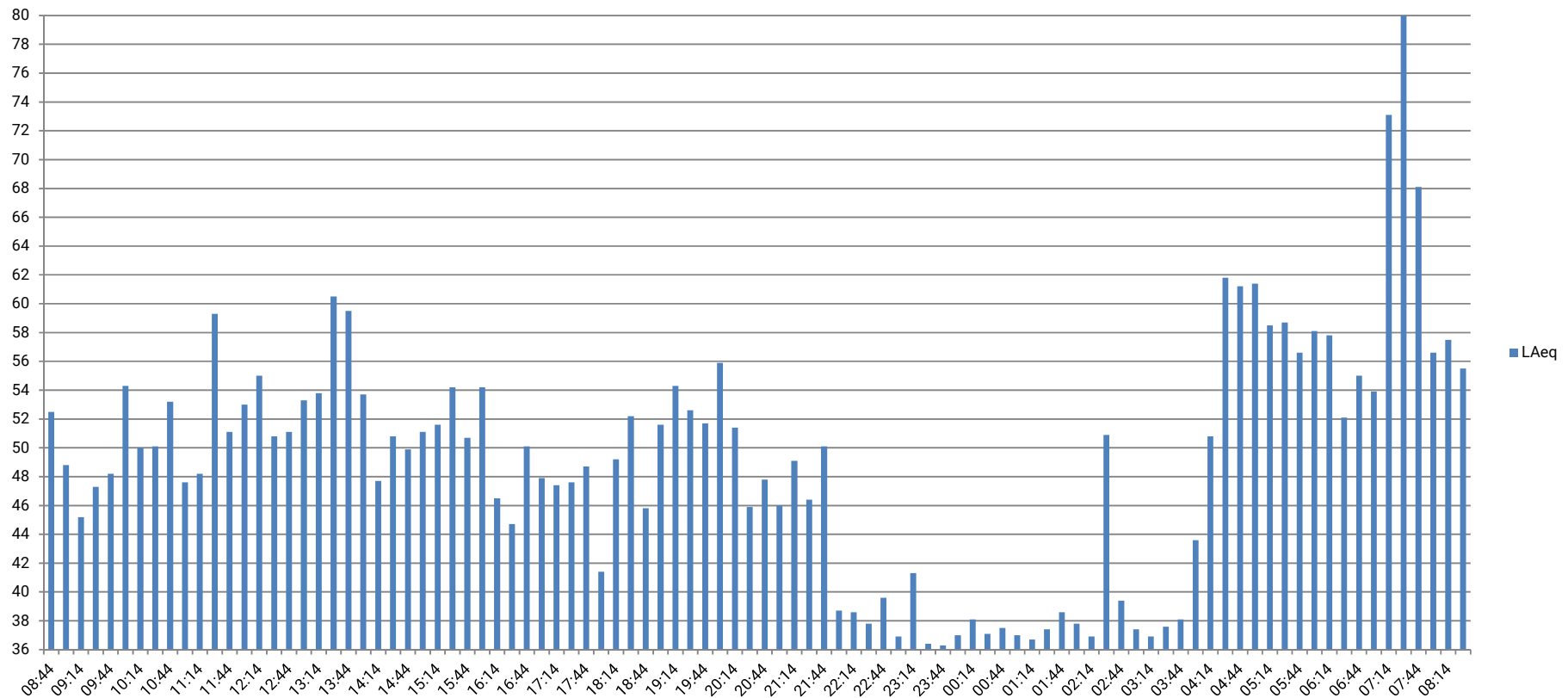
Unit L, Turnpike Way, High Wycombe,
Buckinghamshire, HP12 3TF
Telephone: 020 8848 3031
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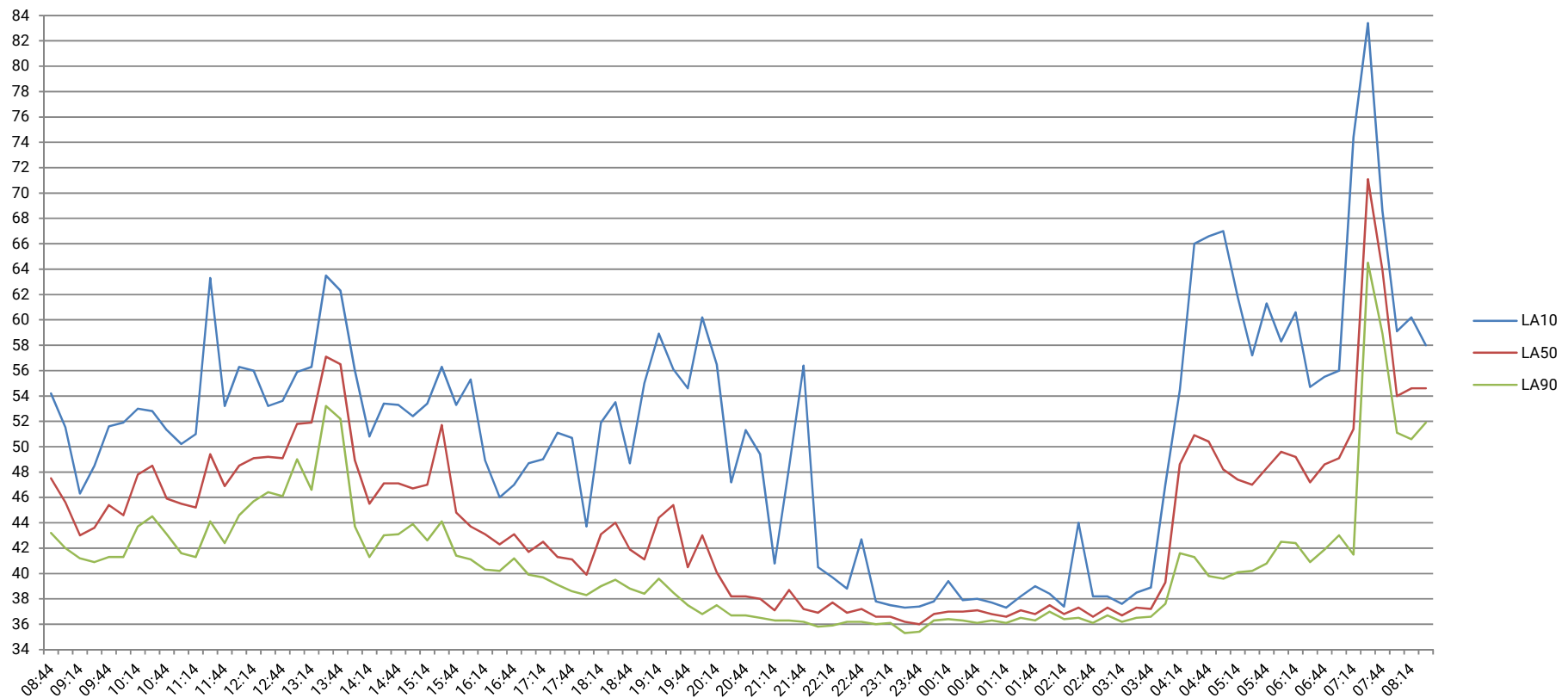
Unit L, Turnpike Way, High Wycombe,
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TITLE: LAeq Levels (Location C)	ISSUE DATE: 15th June 2022				DRAWN BY: MGR				A	B	C	D	E	F	G	H
	CLIENT: Peter Deer & Associates				PF No: 7185				APPROVED BY: MGR							
	PROJECT: Highgate School, North Road, London N6				Q	A	M	I	DESIGN AUTH: MGR				SKETCH No. QF/10731/T5			



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TITLE: LA10; LA50 & LA90 Levels (Location C)	ISSUE DATE: 15th June 2022				DRAWN BY: MGR							
					A	B	C	D	E	F	G	H
					REVISION							
CLIENT: Peter Deer & Associates	PF No: 7185				APPROVED BY: MGR							
PROJECT: Highgate School, North Road, London N6	Q	A	M	I	DESIGN AUTH: MGR							
					SKETCH No. QF/10731/T6							



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APPENDIX 'A'

Raw Data – Noise Survey

6th of June 2022 to 7th of June 2022

Project: Highgate School, North Road, London N6 (Location A)
 Client: Peter Deer & Associates
 Date: 6th to 7th June 2022
 Serial No: 01232570

Address	Start Time	LA _{eq}	LE	Lmax	Lmin	LA ₁	LA ₁₀	LA ₅₀	LA ₉₀	LA ₉₉
1	08:21	57	87	72	47	62	60	55	51	51
2	08:36	56	86	69	45	60	59	55	51	50
3	08:51	53	83	69	41	60	57	50	45	44
4	09:06	53	83	68	41	58	57	51	45	44
5	09:21	55	84	69	42	60	59	52	47	46
6	09:36	55	85	74	41	62	60	52	47	46
7	09:51	58	87	78	38	64	62	48	42	41
8	10:06	54	83	67	39	59	57	50	44	43
9	10:21	56	85	75	41	62	59	50	45	44
10	10:36	54	84	72	40	59	57	51	45	44
11	10:51	53	83	70	40	59	57	49	44	43
12	11:06	50	80	65	39	57	53	45	42	41
13	11:21	53	82	68	39	58	56	48	43	42
14	11:36	67	97	96	39	61	57	50	44	42
15	11:51	55	84	79	38	59	56	49	42	41
16	12:06	54	84	72	38	61	58	50	43	42
17	12:21	50	80	67	37	56	54	47	42	41
18	12:36	52	82	66	42	58	56	49	45	45
19	12:51	54	83	68	42	58	57	52	47	45
20	13:06	53	83	69	43	58	56	50	47	46
21	13:21	50	80	65	42	55	53	48	45	44
22	13:36	51	80	68	42	56	54	47	44	43
23	13:51	55	84	79	40	60	58	48	44	44
24	14:06	52	82	73	39	59	55	47	42	41
25	14:21	57	87	77	39	63	59	47	43	42
26	14:36	50	79	67	38	55	53	45	42	41
27	14:51	53	83	70	42	57	56	52	47	46
28	15:06	53	83	76	40	58	55	50	44	43
29	15:21	52	82	67	40	58	55	50	44	43
30	15:36	58	88	82	44	63	61	54	50	49
31	15:51	55	84	76	41	60	57	49	44	44
32	16:06	52	81	70	41	57	55	49	45	44
33	16:21	55	84	82	41	59	57	51	46	45
34	16:36	54	83	77	43	58	56	51	47	46
35	16:51	54	84	73	39	59	58	52	43	42
36	17:06	51	80	63	39	56	55	47	42	41
37	17:21	53	82	73	38	59	56	48	42	41
38	17:36	50	79	68	35	57	54	43	37	36
39	17:51	51	80	69	34	58	54	42	37	36
40	18:06	49	78	67	37	54	50	41	39	39
41	18:21	53	83	73	37	60	56	45	40	40
42	18:36	50	79	71	38	55	52	44	40	39
43	18:51	52	81	83	37	56	54	42	40	39
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45	19:21	51	81	70	34	58	55	45	39	37
46	19:36	48	78	68	33	55	51	42	37	36
47	19:51	49	79	62	32	56	54	42	36	35
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49	20:21	49	79	66	33	55	53	44	37	36

50	20:36	46	76	64	32	52	49	42	35	34
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54	21:36	44	74	62	31	51	46	36	33	33
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59	22:51	39	68	59	31	39	37	33	32	32
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61	23:21	37	67	57	30	38	36	33	32	32
62	23:36	41	70	63	31	38	36	33	32	32
63	23:51	35	65	52	30	40	37	33	32	31
64	00:06	43	72	65	31	40	37	33	32	32
65	00:21	40	70	62	31	41	38	34	32	32
66	00:36	39	69	62	31	36	35	33	32	32
67	00:51	35	65	55	30	40	36	32	31	31
68	01:06	33	63	44	31	35	34	33	32	32
69	01:21	38	67	58	31	38	36	33	32	32
70	01:36	34	64	46	31	38	36	33	32	32
71	01:51	38	67	54	31	41	35	34	33	32
72	02:06	35	64	51	31	37	35	33	32	32
73	02:21	51	80	68	31	54	40	33	32	32
74	02:36	34	64	45	31	40	36	33	32	32
75	02:51	38	67	54	31	42	35	33	32	32
76	03:06	34	63	42	31	35	34	33	32	32
77	03:21	33	63	41	31	35	34	33	32	32
78	03:36	38	67	60	31	35	35	33	32	32
79	03:51	45	75	68	32	49	46	34	33	33
80	04:06	51	80	66	34	57	54	44	36	35
81	04:21	50	80	74	34	57	54	44	38	37
82	04:36	50	79	69	33	57	52	42	36	36
83	04:51	49	79	67	33	57	53	42	37	36
84	05:06	50	79	68	34	57	51	42	37	37
85	05:21	50	79	65	33	57	53	43	37	36
86	05:36	45	74	63	35	50	48	41	38	37
87	05:51	52	81	67	35	59	55	45	39	38
88	06:06	58	88	76	38	66	61	48	42	40
89	06:21	55	85	73	39	62	60	50	42	41
90	06:36	53	82	73	40	59	57	49	43	42
91	06:51	55	84	78	38	60	58	51	43	41
92	07:06	54	84	72	39	60	58	49	43	42
93	07:21	57	87	76	41	63	59	49	46	45
94	07:36	55	85	74	42	60	58	52	46	45
95	07:51	64	94	77	43	71	70	56	49	48
96	08:06	70	100	85	43	78	76	57	50	49

Project: Highgate School, North Road, London N6 (Location B)
 Client: Peter Deer & Associates
 Date: 6th to 7th June 2022
 Serial No.: 01232569

Address	Start Time	LA _{eq}	LE	Lmax	Lmin	LA ₁	LA ₁₀	LA ₅₀	LA ₉₀	LA ₉₉
1	08:34	59	89	84	46	73	57	53	50	49
2	08:49	52	81	71	45	60	54	49	47	46
3	09:04	54	84	81	45	64	55	50	47	47
4	09:19	52	82	71	45	60	55	50	47	47
5	09:34	53	82	75	45	61	55	49	47	46
6	09:49	56	86	83	44	63	59	49	46	45
7	10:04	52	82	70	44	62	56	49	46	45
8	10:19	54	83	80	45	62	56	49	46	46
9	10:34	57	86	80	45	66	60	51	47	46
10	10:49	54	84	76	44	66	56	49	46	46
11	11:04	53	83	75	44	64	55	47	45	45
12	11:19	54	83	74	45	63	57	50	47	47
13	11:34	59	88	84	44	72	56	49	46	45
14	11:49	51	81	68	44	62	54	47	45	45
15	12:04	51	81	67	44	60	55	49	45	45
16	12:19	50	79	65	44	57	52	48	45	45
17	12:34	51	81	67	45	59	54	49	47	46
18	12:49	52	82	66	44	60	55	50	47	46
19	13:04	52	82	68	44	62	55	50	47	46
20	13:19	51	80	69	44	58	53	49	47	46
21	13:34	50	80	65	44	60	53	48	46	45
22	13:49	69	99	93	43	83	60	49	46	46
23	14:04	52	82	70	43	63	56	47	45	44
24	14:19	48	78	63	43	56	51	46	44	44
25	14:34	51	81	68	43	61	55	47	44	44
26	14:49	50	80	73	43	56	51	47	45	45
27	15:04	50	80	68	43	59	52	48	45	45
28	15:19	49	79	64	44	57	51	48	45	45
29	15:34	52	82	70	44	61	55	50	47	46
30	15:49	51	81	70	44	60	54	49	46	46
31	16:04	50	80	62	44	56	52	49	46	46
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35	17:04	48	78	60	43	55	51	46	44	44
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41	18:34	53	83	76	43	65	54	46	44	43
42	18:49	49	78	67	43	58	51	45	44	44
43	19:04	56	85	89	43	56	50	46	44	44
44	19:19	57	87	81	43	71	55	47	44	44
45	19:34	57	86	80	43	71	55	46	44	43
46	19:49	50	79	69	42	58	53	46	44	43
47	20:04	49	79	71	42	59	51	46	44	43
48	20:19	55	85	69	42	65	60	48	44	43
49	20:34	54	84	72	42	66	59	46	43	43

50	20:49	53	82	73	41	66	52	45	43	43
51	21:04	48	77	69	42	56	50	45	43	43
52	21:19	51	80	72	42	64	51	45	43	43
53	21:34	48	78	70	41	58	49	44	43	42
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55	22:04	44	73	58	41	52	44	42	42	42
56	22:19	44	74	57	41	53	44	43	42	42
57	22:34	43	73	53	41	48	44	43	42	42
58	22:49	43	73	58	41	50	44	43	42	42
59	23:04	43	72	51	42	44	44	43	42	42
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62	23:49	44	73	59	41	51	43	43	42	42
63	00:04	44	73	59	42	51	44	43	43	42
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65	00:34	43	72	50	41	45	43	43	42	42
66	00:49	43	73	56	41	48	43	42	42	42
67	01:04	43	72	47	41	44	43	43	42	42
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69	01:34	43	73	48	42	45	44	43	43	42
70	01:49	44	73	54	42	49	44	43	43	43
71	02:04	44	73	48	42	46	44	44	43	43
72	02:19	43	73	49	42	45	44	43	43	43
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74	02:49	44	74	53	43	51	44	44	43	43
75	03:04	44	73	46	43	45	44	44	43	43
76	03:19	44	73	45	43	45	44	44	43	43
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78	03:49	45	74	56	43	50	46	44	44	44
79	04:04	56	85	77	43	68	56	47	44	44
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81	04:34	59	88	75	43	70	64	46	44	44
82	04:49	52	82	73	43	65	53	46	44	44
83	05:04	56	86	75	43	68	59	47	45	44
84	05:19	53	83	75	44	64	56	47	45	45
85	05:34	56	86	72	44	68	60	47	45	45
86	05:49	54	83	69	44	64	57	48	45	45
87	06:04	58	87	73	44	68	62	51	46	45
88	06:19	61	91	79	44	73	66	51	45	45
89	06:34	59	89	80	45	73	57	48	46	45
90	06:49	52	81	70	44	59	55	49	46	45
91	07:04	54	84	74	43	65	56	49	45	45
92	07:19	54	84	74	43	61	57	52	48	46
93	07:34	59	89	75	45	71	61	51	48	47
94	07:49	69	98	85	44	81	73	53	48	47
95	08:04	68	98	82	44	78	74	54	48	48
96	08:19	66	95	75	48	73	70	57	52	51

Project: Highgate School, North Road, London N6 (Location C)
 Client: Peter Deer & Associates
 Date: 6th to 7th June 2022
 Serial No.: 01121378

Address	Start Time	LA _{eq}	LE	Lmax	Lmin	LA ₁	LA ₁₀	LA ₅₀	LA ₉₀	LA ₉₉
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3	09:14	45	75	68	39	53	46	43	41	40
4	09:29	47	77	65	39	60	49	44	41	40
5	09:44	48	78	61	39	57	52	45	41	40
6	09:59	54	84	78	39	68	52	45	41	40
7	10:14	50	80	64	41	59	53	48	44	42
8	10:29	50	80	66	41	58	53	49	45	42
9	10:44	53	83	77	40	66	51	46	43	41
10	10:59	48	77	65	40	56	50	46	42	40
11	11:14	48	78	65	38	58	51	45	41	40
12	11:29	59	89	77	40	71	63	49	44	42
13	11:44	51	81	69	39	62	53	47	42	40
14	11:59	53	83	74	40	63	56	49	45	43
15	12:14	55	85	80	43	65	56	49	46	44
16	12:29	51	80	68	42	59	53	49	46	44
17	12:44	51	81	70	42	59	54	49	46	45
18	12:59	53	83	68	46	61	56	52	49	48
19	13:14	54	83	73	43	62	56	52	47	44
20	13:29	61	90	80	46	70	64	57	53	51
21	13:44	60	89	78	47	69	62	57	52	49
22	13:59	54	83	76	40	64	56	49	44	41
23	14:14	48	77	66	38	56	51	46	41	40
24	14:29	51	80	68	39	61	53	47	43	41
25	14:44	50	80	67	40	59	53	47	43	42
26	14:59	51	81	75	40	62	52	47	44	42
27	15:14	52	81	73	39	63	53	47	43	40
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31	16:14	47	76	66	38	57	49	43	40	39
32	16:29	45	74	67	38	53	46	42	40	39
33	16:44	50	80	73	39	61	47	43	41	40
34	16:59	48	78	68	38	61	49	42	40	39
35	17:14	47	77	70	38	58	49	43	40	38
36	17:29	48	77	69	37	58	51	41	39	38
37	17:44	49	78	68	37	61	51	41	39	38
38	17:59	41	71	54	37	49	44	40	38	38
39	18:14	49	79	68	37	61	52	43	39	38
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41	18:44	46	75	63	37	56	49	42	39	38
42	18:59	52	81	70	37	64	55	41	38	38
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46	19:59	56	86	72	36	67	60	43	37	36
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48	20:29	46	76	69	35	59	47	38	37	36
49	20:44	48	77	68	36	60	51	38	37	36

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51	21:14	49	79	71	35	65	41	37	36	36
52	21:29	46	76	72	35	57	48	39	36	36
53	21:44	50	80	60	35	60	56	37	36	36
54	21:59	39	68	57	35	47	41	37	36	35
55	22:14	39	68	51	35	47	40	38	36	35
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61	23:44	36	66	44	34	40	37	36	35	35
62	23:59	37	67	43	35	39	38	37	36	36
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68	01:29	37	67	47	35	42	38	37	37	36
69	01:44	39	68	53	35	48	39	37	36	36
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71	02:14	37	67	42	36	38	37	37	36	36
72	02:29	51	81	69	35	66	44	37	37	36
73	02:44	39	69	54	35	51	38	37	36	36
74	02:59	37	67	42	36	40	38	37	37	36
75	03:14	37	67	45	35	40	38	37	36	36
76	03:29	38	67	45	36	42	39	37	37	36
77	03:44	38	68	54	36	45	39	37	37	36
78	03:59	44	73	61	37	53	47	39	38	37
79	04:14	51	80	64	37	58	55	49	42	38
80	04:29	62	91	79	37	74	66	51	41	38
81	04:44	61	91	78	36	72	67	50	40	38
82	04:59	61	91	78	37	72	67	48	40	38
83	05:14	59	88	76	37	71	62	47	40	38
84	05:29	59	88	79	37	72	57	47	40	38
85	05:44	57	86	74	37	68	61	48	41	39
86	05:59	58	88	77	38	71	58	50	43	39
87	06:14	58	87	77	39	70	61	49	42	40
88	06:29	52	82	71	38	64	55	47	41	39
89	06:44	55	85	78	38	67	56	49	42	40
90	06:59	54	84	72	38	65	56	49	43	40
91	07:14	73	103	96	38	82	74	51	42	39
92	07:29	80	110	97	61	93	83	71	65	62
93	07:44	68	98	88	47	81	69	64	59	51
94	07:59	57	86	74	48	66	59	54	51	49
95	08:14	58	87	76	46	66	60	55	51	49
96	08:29	56	85	68	49	61	58	55	52	50

QF10731/PF7185/RP1

EMTEC PRODUCTS LTD.

APPENDIX 'B'

Photos and Drawings

Residential Properties
on Broadlands Road
(Photos C,D & E)

No 27 Broadlands Road
(Photo F)

Microphone Location B on
boundary with No 27
(Photo G)

Microphone Location C at the
rear of site (Photos H & I)

Existing
Sports Hall

Microphone
Location A
(Photo B)



Photo A - Aerial view of site with microphone locations and adjacent residential properties

Houses on the other side of
Broadlands Road

Microphone Location A

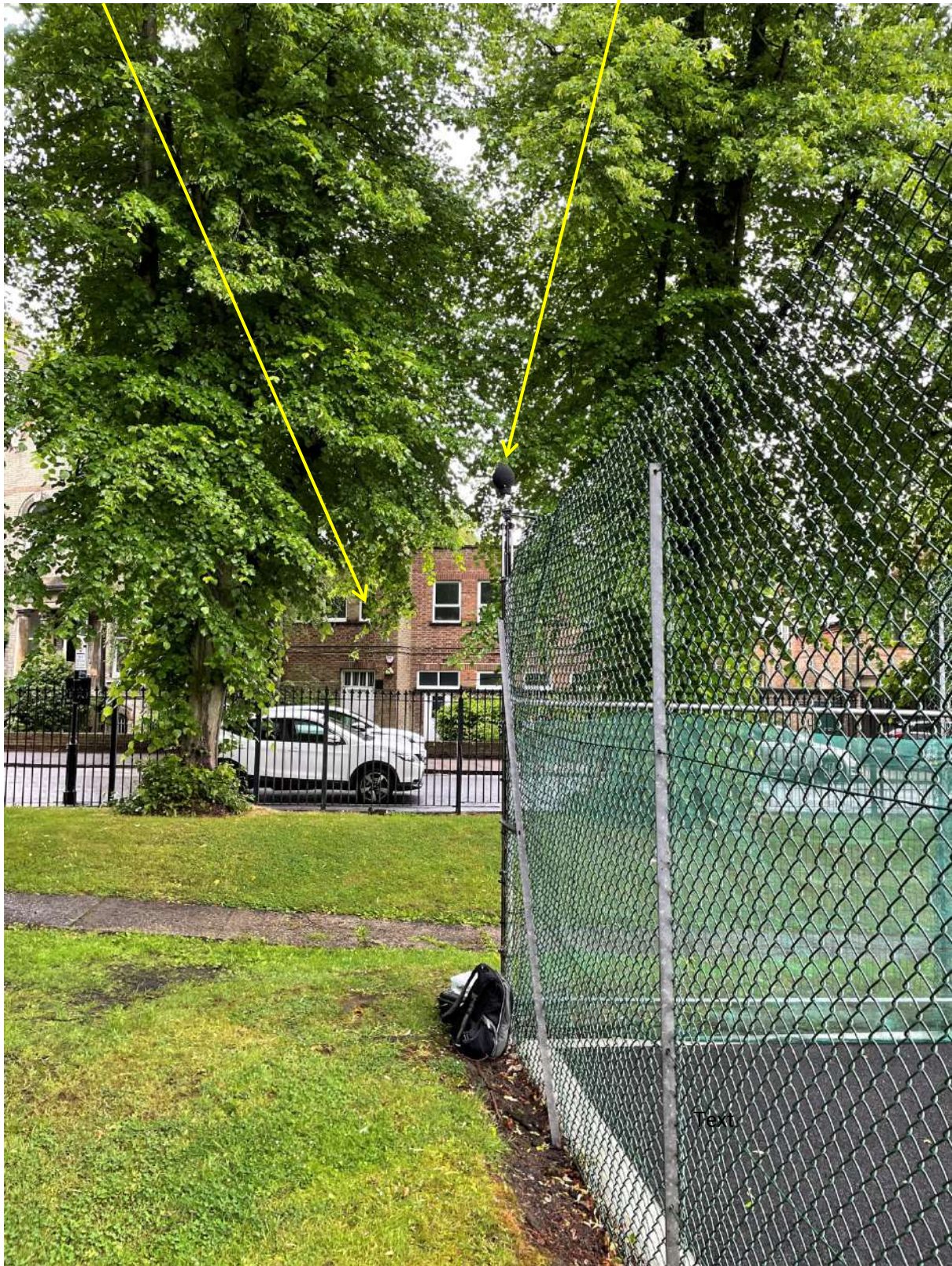


Photo B - Microphone location A on the corner of the tennis court opposite houses in Broadlands Road



Photo C - Residential house on the other side of Broadlands Road



Photo D - Residential houses on the other side of Broadlands Road



Photo E - Residential house on the other side of Broadlands Road



Photo F - Boundary Wall to No 27 Broadlands Road

Microphone Location B

Windows of 27 Broadlands Road



Photo G - Microphone location B on the boundary to No 27 Broadlands Road

Microphone Location C

Rear of No 27 Broadlands Road



Photo H - Microphone location C in the field at the rear of No 27 Broadlands Road

Existing Sports Hall Building

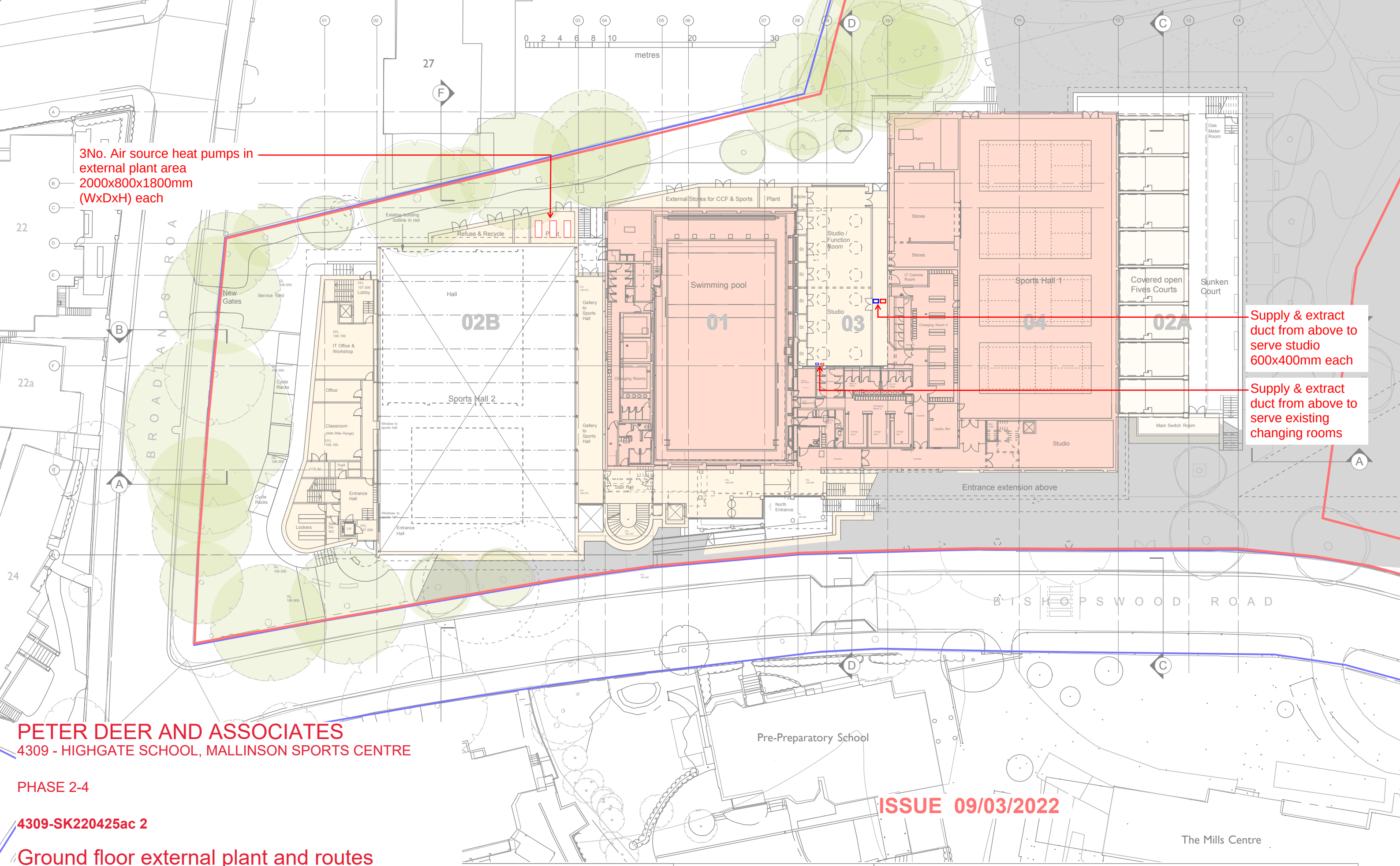
Microphone Location C



Photo I - Microphone location C with the existing sports Hall building behind



Photo J - Open field to the rear of the location of Microphone C



PETER DEER AND ASSOCIATES
4309 - HIGHGATE SCHOOL, MALLINSON SPORTS CENTRE

PHASE 2-4

4309-SK220425ac 2

Ground floor external plant and routes

ed toovey architects

studio 401 royle building
31 wenlock road
london n1 7sh
07880 725763
edtoovey@yahoo.co.uk

Revisions:

PLANNING ISSUE

- Always take site measurements
to verify dimensions
- Refer to M&E Engineers
drawings for all services



Highgate School MSC 4-Phase Scheme

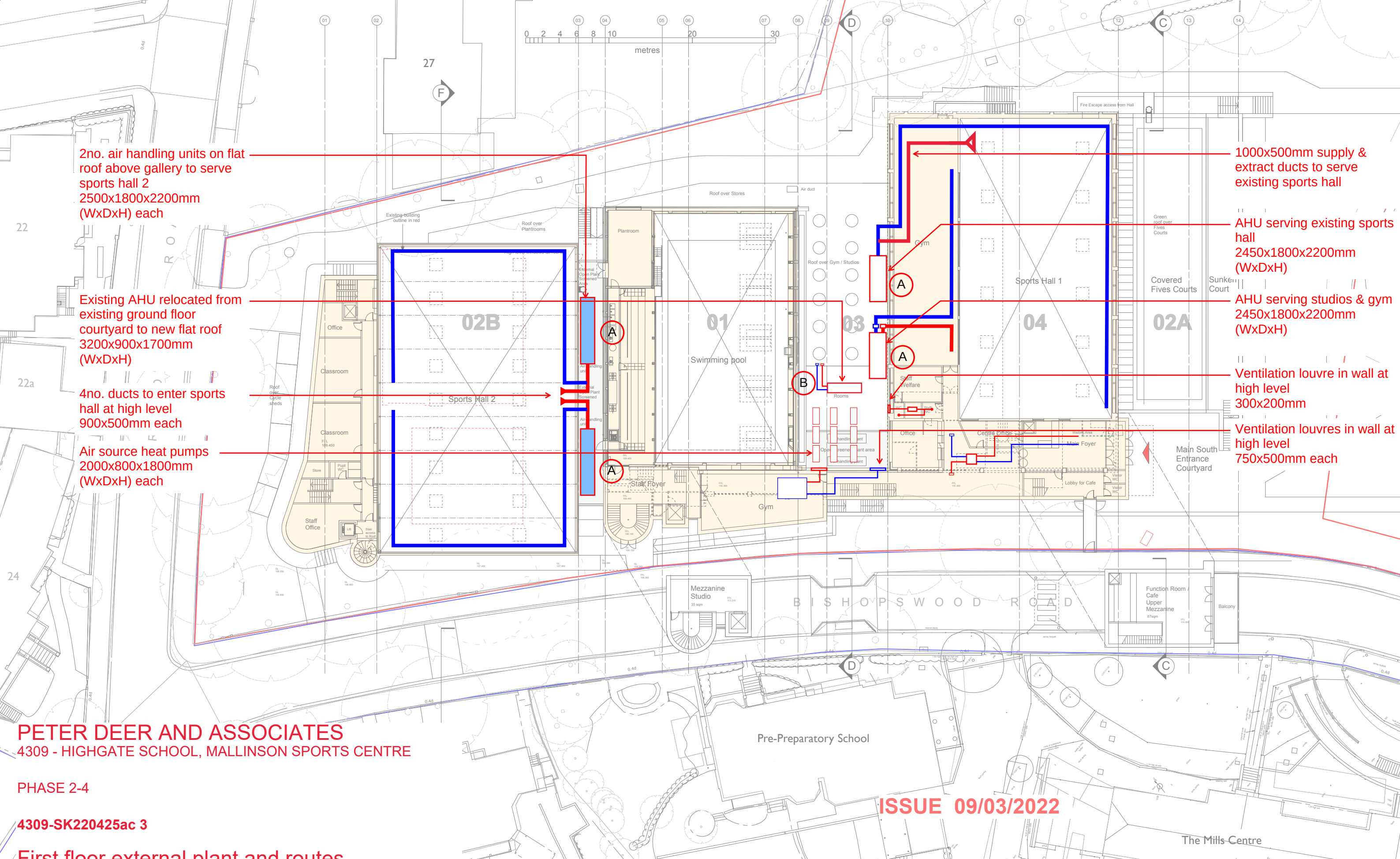
Ground Floor Plan Level 2 proposed

January 2022

Drwg No. 1182 / GA / 011 -

Scale 1:200 @ A1 / 1:400 @ A3

ISSUE 09/03/2022



ed tooveyarchitects

studio 401 royle building
31 wenlock road
london n1 7sh
07880 725763
edtoovey@yahoo.co.uk

Revisions:

PLANNING ISSUE

- Always take site measurements
to verify dimensions
- Refer to M&E Engineers
drawings for all services



Highgate School MSC 4-Phase Scheme

First Floor Plan Level 3 proposed

January 2022

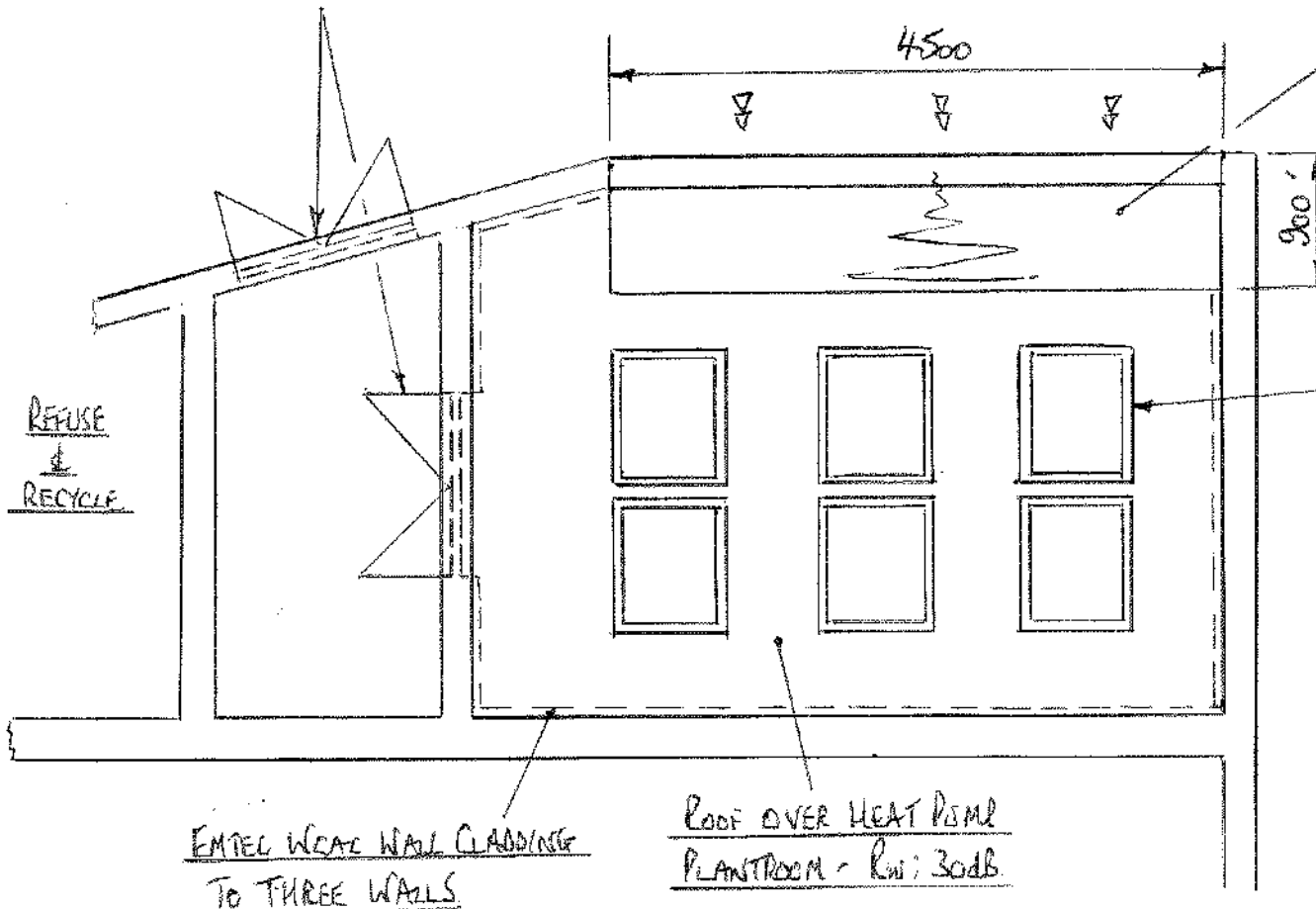
Drwg No. 1182 / GA / 012 -

Scale 1:200 @ A1 / 1:400 @ A3

Revision	Issued	Date

ACCESS TO PLANTROOM THROUGH
2 SETS OF WELL SEALED SOLID
CORE DOORS (EACH RW: 30dB)

INLET SILENCER - EMTEC RAAC/33/300LF
4500mm x 2400mm x 900mm LONG - 18.48m³/sec
AT 14 PASCALS P.D.



OUTLET SILENCERS - EMTEC PAC 30
PLENUM SILENCERS - 920 x 760 x
1500 HIGH - 3.08m³/sec EACH AT
NEGLECTABLE P.D.

OVERALL HEIGHT OF AVG. CONDENSER
AND OUTLET SILENCER - 2949mm

Project <u>HIGHGATE SCHOOL - MSC PHASE 4</u>						Title <u>LAYOUT OF CONDENSER</u> <u>PLANTROOM.</u>	 Unit 1, Turn Pike Way, High Wycombe, Buckinghamshire, HP12 3TF Telephone : 020 8848 3031 www.emtecpducts.co.uk	Revision -
Client <u>PETER DEER ASSOCIATES</u>								Works order No. PF
Designed by <u>MGR</u>	Checked by <u>MGR</u>	Approved by - date <u>[Signature] 24/6/22</u>	Filename <u>010731</u>	Date drawn <u>20/6/2022</u>	Scale <u>NTS</u>	ALL DIMENSIONS IN mm UNLESS STATED	Drawing Number <u>QF/10731/GA1</u>	