

TECHNICAL NOTE

Project Camden Schools– SCCS Site

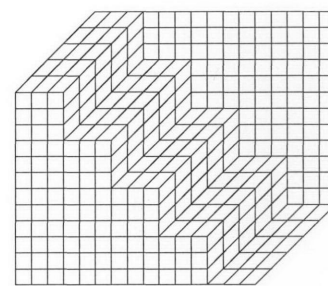
Subject Planning Conditions – Acoustics - Permanent Plant

Author David ONeill

Ref SCCS DN07

Date 24th November 2011

Job 025901



Buro Happold

The SCCS scheme is a secondary school in South Camden. It has planning permission from London Borough of Camden (LBC) subject to various planning conditions. In respect of plant noise, conditions 9 and 10 relate to the permanent scheme and condition 2 relates to the temporary accommodation.

This technical note refers to the noise from permanent plant which comprises primarily Air Handling Units and various extract fans distributed across the various buildings of the scheme.

Planning Condition

The following conditions have been imposed by LBC for the permanent plant:

Permanent Scheme

9. At 1 metre outside the windows of any neighbouring habitable room the level of noise from all plant and machinery shall be at all times at least 5 decibels below the existing background noise levels, expressed in dB(A) at such locations. Where the noise from the plant and machinery is tonal in character the differences in these levels shall be at least 10 dB(A)

10. Technical specification details of the mechanical plant to be installed within the plant areas shown on the submitted floor plans approved, together with an accompanying acoustic report, shall be submitted to and approved by the local planning authority prior to installation of this plant. The plant shall not be operated other than in complete accordance with such measures as may be approved

Plant Noise Limits

The plant noise limits are derived in relation to the background noise levels in the absence of the plant. A baseline noise survey was carried out by Hoare Lea as part of the original planning application for the scheme. Their survey was reported in their report "South Camden Community School – Acoustic Strategy Report" dated 10/07/08 (their reference MR-1002999). This report was prepared for London Borough of Camden prior to the appointment of the current

design and development team. Background noise levels around the school were measured at several positions. This included an unattended long term monitor as well as some short term attended monitoring.

The report documents the noise measurements and states plant noise limits applicable to the scheme, which are 5 dB below the measured background noise. This corresponds with the requirements of planning conditions 9 and 10 above. Their report gives the following noise limits in Table 7 of the report, these are implemented as the plant noise limits for this scheme:

Period	Prevailing background noise levels (L_{A90})	Plant Noise Rating Limit (L_{Aeq})
Day (0700 – 1900)	42 dB	37 dB
Night (2300 – 0700)	37 dB	32 dB

Proposed Plant Scheme

Details of the operational plant scheme have been provided by Buro Happold services and BAM Construction. The plant details in terms of plant specification, noise levels and distance to receptors are shown in the calculation sheets. Noise data has been provided in terms of sound power level in octave bands from manufacturers.

The location of the plant is shown on the Buro Happold services drawings. As these are distributed around the site and there are several different residential receptors to be considered. The receptor locations (numbered 1 to 4) and indicative locations of the plant are shown in marked up drawings in Figure 1, showing the main area and in Figure 2 showing the youth / sports building. These are indicative only and the actual locations are on differing roof levels; the services drawings should be referenced for full details.

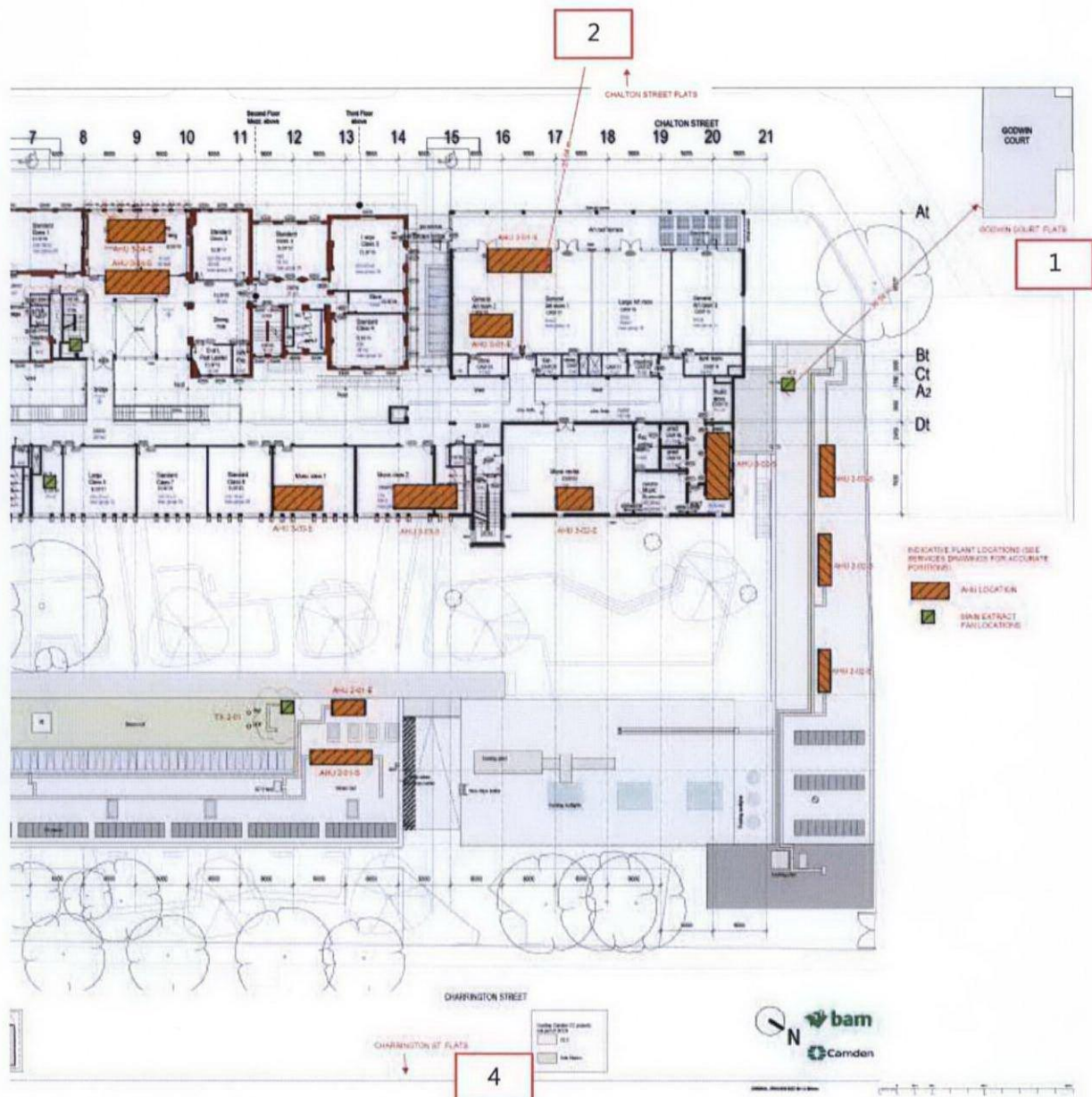


Figure 1: Location of Main Plant Areas and Housing

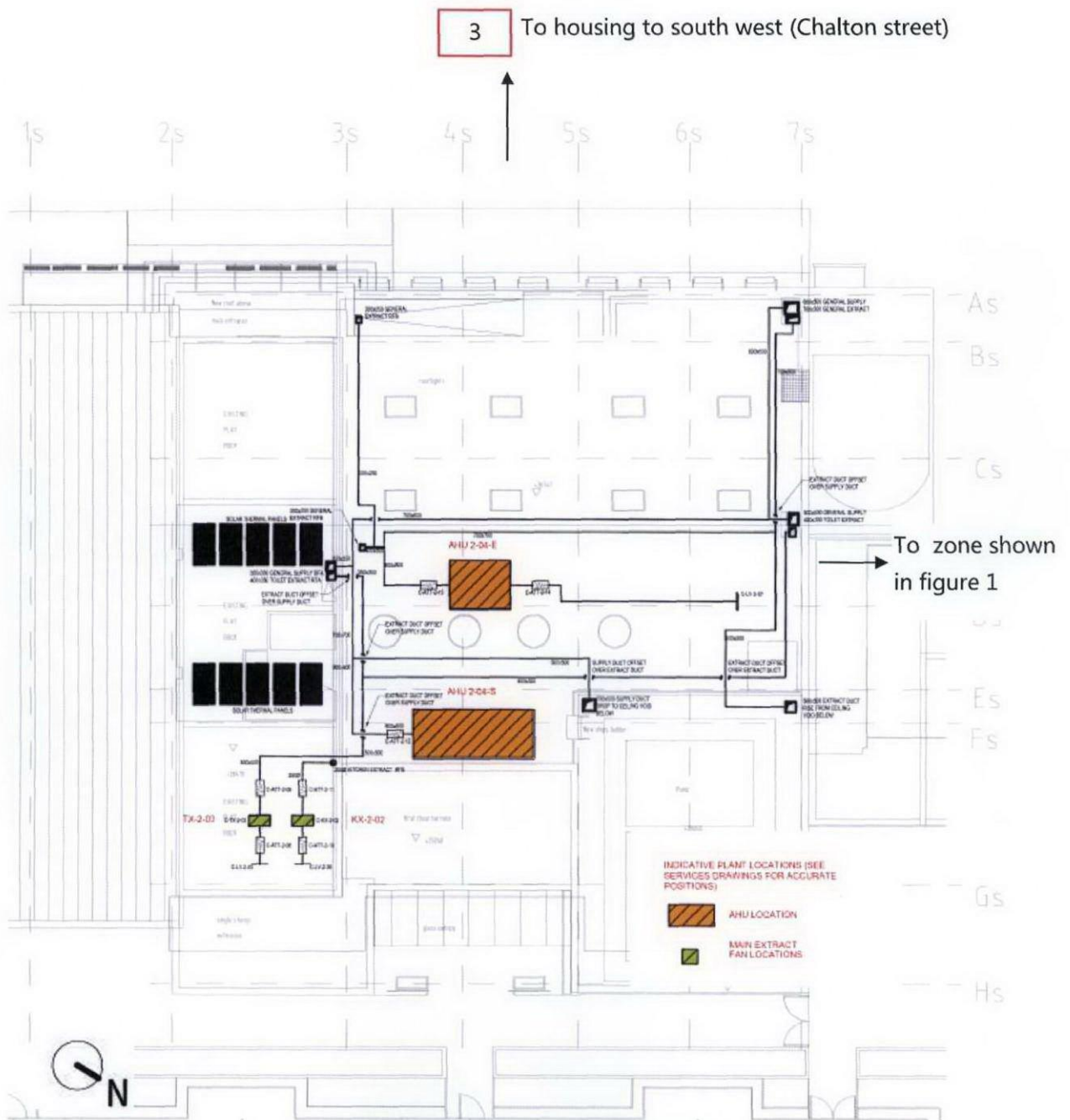


Figure 2: Location of plant on youth/sports building (south of zone shown in Figure 1)

Plant Noise Calculations

Plant noise calculations have been prepared for the four receptor positions. The calculation includes the effect of the noise mitigation treatment which is being implemented to meet the limits. The supplier has proposed attenuators, and in most cases these are adequate to meet the limits. There are only a few items of plant where additional treatment is required. These have been identified to the team and discussed and agreed with the services designers. The requirements have been implemented in the design. Therefore, this report documents the current design proposal.

There is one case, the main kitchen extract fan, where it is possible that an alternative plant item may be sourced. The scheme below is based on the current selection and meets the noise limits with a casing enclosure and increased attenuation. However, if an alternative fan were selected it would be selected to be quieter and also designed, along with any attenuation measures, to meet the aggregate noise limit at the housing.

Table 1 shows the aggregate plant noise levels predicted at four different residential locations. The calculation assumes all plant is running simultaneously and is therefore a worst case condition. The critical location is to the north-west (Godwin Court) and the full calculation is appended for this position. A similar calculation has been prepared for all receptor positions.

Table 1: Plant noise levels at nearest affected housing			
Receptor	Plant noise level with all plant running	Plant noise limit	Compliant?
1 North West – Chalton St (Godwin Court)	37 dB	37 dB	Yes
2 South West – Chalton St (flats at north end 119-146)	36 dB	37 dB	Yes
3 South West – Chalton St (flats opposite youth/sports)	34 dB	37 dB	Yes
4 North East – Charrington St (houses opposite plant zone)	29 dB	37 dB	Yes

Summary

The plant noise levels calculated at all residences around the site meet the daytime limit of 37 dB(A). The plant will not be used during the night and therefore the daytime and early evening limit is appropriate. The proposed plant and mitigation scheme therefore meets the local authority standard criteria for plant noise.

Calculation: Noise Level of all plant to Godwin Court to North West

							Octave Band Centre Frequency, Hz								
South Camden Community School							63	125	250	500	1000	2000	4000	dB(A)	
From: All Rooftop plant														day	
To: Housing To North - Chilton Street (Godwin Court - tower)														total	
Total - sum of all plant operating														37.4	
							day excess		eve excess						
							dB	dB		dB	dB				
Camden Planning Noise Limit							37	0		37	0				

Calculation for individual plant items				Octave Band Centre Frequency, Hz								
				63	125	250	500	1000	2000	4000		
1	Ahu 2-03 - supply inlet			63.0	72.0	54.0	45.0	45.0	43.0	37.0	57.1	
	end reflection, 800mm, 800mm			4.0	1.0	0.0	0.0	0.0	0.0	0.0		
		Lw		59.0	71.0	54.0	45.0	45.0	43.0	37.0		
	Atmosphere	distance	37.5m	42.5	42.5	42.5	42.5	42.5	42.5	42.5		
		directivity : 30°,90°, 800mm, 800mm		3.5	3.5	2.5	1.5	-11.0	-11.0	-11.0		
		Lp		20.0	32.0	14.0	4.0	-8.5	-10.5	-16.5	16.5	dB(A)
	shielding	0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		
	SPL at housing			20.0	32.0	14.0	4.0	-8.5	-10.5	-16.5	16.5	dB(A)
2	Ahu 2-02 - supply outlet			63	125	250	500	1000	2000	4000		
				56.0	54.0	51.0	40.0	44.0	46.0	40.0	50.8	
	end reflection, 800mm, 800mm			4.0	1.0	0.0	0.0	0.0	0.0	0.0		
		Lw		52.0	53.0	51.0	40.0	44.0	46.0	40.0		
	Atmosphere	distance	40.4m	43.1	43.1	43.1	43.1	43.1	43.1	43.1		
		directivity : 30°,30°, 800mm, 800mm		5.0	6.0	6.0	7.0	8.0	8.0	8.0		
		Lp		13.9	15.9	13.9	3.9	8.9	10.9	4.9	15.0	dB(A)
	shielding	0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		
	SPL at housing			13.9	15.9	13.9	3.9	8.9	10.9	4.9	15.2	dB(A)
3	Ahu 3-01 - supply supply airside (inlet)			63	125	250	500	1000	2000	4000		
				64.0	70.0	47.0	40.0	38.0	38.0	38.0	54.6	
	end reflection, 800mm, 800mm			4.0	1.0	0.0	0.0	0.0	0.0	0.0		
		Lw		60.0	69.0	47.0	40.0	38.0	38.0	38.0		
	Atmosphere	distance	50.4m	45.0	45.0	45.0	45.0	45.0	45.0	45.0		
		directivity : 30°,30°, 800mm, 800mm		5.0	6.0	6.0	7.0	8.0	8.0	8.0		
		Lp		20.0	30.0	8.0	2.0	1.0	1.0	1.0	14.8	dB(A)
	shielding	0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		
	SPL at housing			20.0	30.0	8.0	2.0	1.0	1.0	1.0	14.9	dB(A)
4	Ahu 3-01 - extract			63	125	250	500	1000	2000	4000		
	Extract air side (outlet)			72.0	87.0	90.0	88.0	81.0	76.0	71.0	88.1	
	Additional attenuation			0.0	0.0	5.0	7.0	0.0	0.0	0.0		
	end reflection, 800mm, 800mm			4.0	1.0	0.0	0.0	0.0	0.0	0.0		
		Lw		68.0	86.0	85.0	81.0	81.0	76.0	71.0		
	Atmosphere	distance	60.3m	46.6	46.6	46.6	46.6	46.6	46.6	46.6		
		directivity : 30°,150°, 800mm, 800mm		3.5	3.5	2.5	1.5	-11.0	-11.0	-11.0		
		Lp		24.9	42.9	40.9	35.9	23.4	18.4	13.4	36.4	dB(A)
	shielding	5		5.0	5.0	5.0	5.0	5.0	5.0	5.0		
	SPL at housing			19.9	37.9	35.9	30.9	18.4	13.4	8.4	31.4	dB(A)
5	Ahu 3-02 - supply supply airside (inlet)			63	125	250	500	1000	2000	4000		
				67.0	76.0	62.0	51.0	49.0	48.0	43.0	61.6	
	end reflection, 800mm, 800mm			4.0	1.0	0.0	0.0	0.0	0.0	0.0		
		Lw		63.0	75.0	62.0	51.0	49.0	48.0	43.0		
	Atmosphere	distance	45.4m	44.1	44.1	44.1	44.1	44.1	44.1	44.1		
		directivity : 30°,30°, 800mm, 800mm		5.0	6.0	6.0	7.0	8.0	8.0	8.0		
		Lp		23.9	36.9	23.9	13.9	12.9	11.9	6.9	23.2	dB(A)
	shielding	0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		
	SPL at housing			23.9	36.9	23.9	13.9	12.9	11.9	6.9	23.2	dB(A)

				Octave Band Centre Frequency, Hz									
				63	125	250	500	1000	2000	4000			
6	Ahu 3-02 - extract			63	125	250	500	1000	2000	4000			
	Extract air side (outlet)			70.0	81.0	71.0	66.0	58.0	59.0	57.0	69.6		
	mitred bend, 1000mm			1.0	6.0	8.0	4.0	3.0	3.0	3.0			
	end reflection, 800mm, 800mm			4.0	1.0	0.0	0.0	0.0	0.0	0.0			
	Lw			65.0	74.0	63.0	62.0	55.0	56.0	54.0			
Atmosphere			distance	55.3m	45.9	45.9	45.9	45.9	45.9	45.9			
			directivity : 30°,30°, 800mm, 800mm		5.0	6.0	6.0	7.0	8.0	8.0	8.0		
			Lp		24.1	34.1	23.1	23.1	17.1	18.1	16.1	25.6	dB(A)
shielding			0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		
SPL at housing					24.1	34.1	23.1	23.1	17.1	18.1	16.1	25.8	dB(A)
7	Ahu 3-03 - supply			63	125	250	500	1000	2000	4000			
	supply airside (inlet)			61.0	70.0	46.0	42.0	42.0	46.0	44.0	55.6		
	end reflection, 800mm, 800mm			4.0	1.0	0.0	0.0	0.0	0.0	0.0			
	Lw			57.0	69.0	46.0	42.0	42.0	46.0	44.0			
	Atmosphere			distance	75.2m	48.5	48.5	48.5	48.5	48.5	48.5		
			directivity : 30°,150°, 800mm, 800mm		3.5	3.5	2.5	1.5	-11.0	-11.0	-11.0		
			Lp		12.0	24.0	0.0	-5.0	-17.5	-13.5	-15.5	8.2	dB(A)
shielding			0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		
SPL at housing					12.0	24.0	0.0	-5.0	-17.5	-13.5	-15.5	8.2	dB(A)
8	Ahu 3-03 - extract			63	125	250	500	1000	2000	4000			
	Extract air side (outlet)			57.0	69.0	57.0	58.0	53.0	56.0	56.0	62.5		
	end reflection, 800mm, 800mm			4.0	1.0	0.0	0.0	0.0	0.0	0.0			
	Lw			53.0	68.0	57.0	58.0	53.0	56.0	56.0			
	Atmosphere			distance	87.2m	49.8	49.8	49.8	49.8	49.8	49.8		
			directivity : 30°,150°, 800mm, 800mm		3.5	3.5	2.5	1.5	-11.0	-11.0	-11.0		
			Lp		6.7	21.7	9.7	9.7	-7.8	-4.8	-4.8	10.1	dB(A)
shielding			0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		
SPL at housing					6.7	21.7	9.7	9.7	-7.8	-4.8	-4.8	10.2	dB(A)
9	kitchen extract (KX 2-01)												
	outlet side	plus ATT 2-06		85.0	104.0	85.0	79.0	81.0	80.0	76.0			
	CAICE attenuator 11s			3.0	9.0	18.0	20.0	9.0	8.0	6.0			
	additional attenuation				8.0								
	end reflection, 800mm, 800mm			4.0	1.0	0.0	0.0	0.0	0.0	0.0			
			Lw	78.0	86.0	67.0	59.0	72.0	72.0	70.0			
Atmosphere			distance	30.6m	40.7	40.7	40.7	40.7	40.7	40.7	40.7		
			directivity : 30°,150°, 800mm, 800mm		3.5	3.5	2.5	1.5	-11.0	-11.0	-11.0		
			Lp		40.8	48.8	28.8	19.8	20.3	20.3	18.3	33.7	dB(A)
shielding			0		0.0	0.0	0.0	0.0	0.0	0.0	0.0		
SPL at housing					40.8	48.8	28.8	19.8	20.3	20.3	18.3	33.7	dB(A)
				14.6	32.7	20.2	16.6	20.3	21.5	19.3			

