Philip Acoustics Ltd.

Consultants in Noise and Vibration

REPORT TITLE: ACOUSTIC REPORT IN SUPPORT OF PLANNING APPLICATION FOR EXTERNAL AIR CONDITIONING EQUIPMENT AT 4 GREENLAND PLACE, LONDON NW1 0AP

REPORT REF: 17216-002 *Revision A*

Revision	Issue Date	Commentary
-	October 2017	Initial acoustic report
A	December 2017	Incorporates Policy A4 – Noise & Vibration of Section 6 - Protecting Amenity of Camden Local Plan (adopted June 2017) and with recommended noise reduction treatment specification

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DATE: December 2017

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ANC ACOUSTICS & NOISE CONSULTANTS

CONTENTS

SUMMARY

- Philip Acoustics has been commissioned to assess noise and vibration from the existing air conditioning equipment at 4 Greenland Place, London NW1 0AP. The assessment considers London Borough of Camden's planning consent noise conditions for mechanical services equipment as contained in Policy A4 – Noise and Vibration of Section 6 – Protecting Amenity of Camden Local Plan (adopted June 2017).

- As part of the assessment a background noise survey has been carried out at the site over a five day period including weekdays and a weekend to establish lowest existing background noise levels representative of outside neighbouring residential windows during operational times of the equipment.

- Based on results of the background noise survey and acoustic calculations using equipment manufacturer's noise data it is established that noise reduction treatment is required to one of the equipment items. Specification details for the suitable noise reduction treatment are included in Section 5.1 of the report.

- Proposed new location of the equipment is not structurally linked to any adjacent residential properties and therefore there will be no potential for any structure-borne vibration from the equipment to transfer to adjacent residential properties. Nevertheless, it is anticipated the equipment will be installed using vibration isolators as good practice.

1. INTRODUCTION

Philip Acoustics has been commissioned to assess noise and vibration from the existing air conditioning equipment at 4 Greenland Place, London NW1 0AP.

As part of the redevelopment of 4 Greenland Place, nine existing air conditioning units (currently installed within third floor plant area) are proposed to be relocated to a new plant area at the flat roof of the new third floor roof extension to the existing building. The equipment serves commercial (office) space within the building.

It is anticipated that as part of the planning process for the relocation of the existing equipment, the Local Planning Authority (London Borough of Camden) will require information in the form of an acoustic report regarding noise from the relocated equipment in order to seek to protect the amenity of residents in the vicinity with regard to possible noise emissions from the equipment.

Philip Acoustics has therefore been commissioned to provide an acoustic assessment for the equipment. This report presents results of the assessment and includes:-

- Confirmation of London Borough of Camden's planning consent noise requirements;
- Measurement of existing background noise levels;
- Calculation of equipment noise levels;
- Consideration of vibration from the equipment;
- Review of noise/vibration control treatments necessary to comply with London Borough of Camden's planning consent requirements.

2. LONDON BOROUGH OF CAMDEN NOISE REQUIREMENTS

Policy A4 – *Noise and Vibration* of Section 6 – *Protecting amenity* of Camden Local Plan (adopted June 2017) covers in detail noise issues relating to a wide range of planning and noise pollution scenarios, including mechanical services equipment and has been copied below:

Policy A4 Noise and vibration

The Council will seek to ensure that noise and vibration is controlled and managed.

Development should have regard to Camden's Noise and Vibration Thresholds (Appendix 3). We will not grant planning permission 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.

We will only grant permission for noise generating development, including any plant and machinery, if it can be operated without causing harm to amenity. We will also seek to minimise the impact on local amenity from deliveries and from the demolition and construction phases of development.

Camden's Noise and Vibration Thresholds are listed in Table C of Appendix 3 which has been copied below:

Table C: Noise levels applicable to proposed industrial and commercial developments (including plant and machinery)

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 57dBL_{Amax}	'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dB L_{Amax}	'Rating level' greater than 5dB above background and/or events exceeding 88dBL_{Amax}

Section *Industrial and Commercial Noise Sources* of Appendix 3 includes the statements: "Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 '*Methods for rating and assessing industrial and commercial sound*' (BS 4142) will be used. For such cases a 'Rating Level' of 10dB below background (15dB if tonal components are present) should be considered as the design criterion".

Note it is the author's experience and observation based on octave band noise data and on-site noise measurements of similar modern air conditioning condensers, that the type of Daikin air conditioning condensers subject to this assessment generally generate a typically broadband type of noise (i.e. without any strong tonal or intermittent characteristics sufficient to attract attention), however as some of the equipment units may have 'slight' tonal noise characteristics, therefore cautiously the more onerous noise limit (15dB below background) of London Borough of Camden's planning consent noise conditions is applied in this instance.

The design criterion is applicable to gardens used as amenity spaces and/or to outside residential windows. For this site, there is no gardens observed within immediate vicinity, therefore the nearest noise sensitive location is identified to be outside existing residential windows within upper floor levels of a neighbouring building at 154-156 Camden High Street. However as a 'worse case' the noise assessment within this report is cautiously carried out to outside residential and commercial windows as well as commercial external amenity space (roof terrace) all as described in Section 3.2 on the following page.

3. NOISE SURVEY

In order to assess noise from the existing equipment it is necessary to establish representative background noise levels at the nearest noise sensitive location. Details of the background noise survey carried out by Philip Acoustics are provided in Sections 3.1 to 3.3.

3.1 Noise Survey Instrumentation

Details of the instrumentation used for the noise survey are provided in Appendix A. The sound level meters were calibrated before and after the survey measurements using the UKAS certified calibrator.

3.2 Noise Survey Details and Procedure

The client has advised the equipment will operate during specific daytime periods only (expected nominally in the range 9am to 6pm Monday to Friday) and therefore the survey was carried out over at least a full 24 hour period to obtain existing noise levels during the entire range of operational times.

The noise survey was carried out over five days from 5 October 2017 to 9 October 2017 including sample weekdays and a weekend; the weather included dry and calm conditions during the survey day and also night periods.

It is proposed that all nine existing air conditioning units be relocated to within the new roof plant area of the proposed new third floor roof extension to the existing building. It is identified that the nearest noise sensitive (residential) windows of neighbouring residential properties to this proposed location to be the upper floor level windows at 154-156 Camden High Street approximately 22m straight line distance. However as a 'worse case' the noise assessment within this report is cautiously carried to three (residential and commercial) locations:

- Location 1: Outside residential windows to the rear of 154-156 Camden High Street (3rd floor);
- Location 2: Outside commercial windows to the rear of buildings at Camden High Street (2nd floor);
- Location 3: To café/restaurant roof terrace to the rear of buildings at Camden High Street (1st floor).

The background noise survey measurement position was at third floor roof level of the existing building at 4 Greenland Place facing directly towards the above locations using an extension pole and microphone extension lead arrangement. This measurement position was selected as being best achievable/accessible and representative of the nearest noise sensitive locations (as described above).

Measurements of background noise levels were recorded as overall L_{A90} dB values over 15 minute periods for entire duration of the five day survey.

Proposed location for the equipment, direction to the nearest noise sensitive locations and indication of the measurement position are shown on marked up drawing in Appendix B.

The sound level meter was set up to record background noise levels over 60 minute periods (split into 4 x 15 minute periods to enable more accurate analysis of results as required). Measurements of background noise were recorded as overall L_{A90} dB values.

In addition to the overall L_{A90} dB values, several manual samples of linear L_{90} dB octave band background noise were also recorded using the Bruel & Kjaer 2260 sound level meter to establish typical background noise octave band spectra.

3.3 Noise Survey Results

Existing background noise levels in the vicinity are predominantly due to traffic on Camden High Street west of the site and Camden Street east of the site.

A graph showing the overall raw data L_{A90} dB values over the entire five day background noise survey period is provided in Appendix C.

Summary of the lowest measured background noise level in terms of overall L_{A90} dB values over the entire range of proposed operational times for the equipment (nominally Monday to Friday between 9am to 6pm) representative of the nearest noise sensitive locations as described in Section 3.2 and the applicable London Borough of Camden's planning consent noise limit are shown in Table 1.

Description	**Equipment Operating Times**	**Minimum Existing Background Noise $L_{A90\ (15\ min)}$**	**Noise Limit 15dBA Below Minimum Existing Background Noise**
Minimum background level	Assume all nine units operating simultaneously between 9am-6pm Mon-Fri	50dB	≤ 35dBA

Table 1: Minimum background noise level and corresponding noise limit applied

4. NOISE FROM MECHANICAL SERVICES EQUIPMENT

The client has advised the existing air conditioning equipment which is to be relocated consist of nine units:

- Item AC-1-1: 1 x Daikin unit model RXS60F4V1B;
- Items AC-1-2 & AC-G-2: 2 x Daikin unit model RZQG71L8V1B;
- Items AC-1-3 & AC-1-4: 2 x Daikin units model RXS50K2V1B;
- Item AC-2-1: 1 x Daikin unit model RZQSG71L3V1B;
- Items AC-2-2 & AC-2-3: 2 x Daikin unit model RXS35K2V1B;
- Item VRV Condenser: 1 x Daikin unit model REYQ14P8Y1B.

Proposed location of the equipment is indicated on a drawing in Appendix B. Manufacturer's noise data for the equipment is provided in Appendix D. Summary of noise from the equipment in terms of overall dBA sound pressure level at 1m is shown in Table 2.

The client has advised that all nine units will have capability to operate in both heating and cooling modes. For the purpose of this noise assessment report it is cautiously taken that the units are operating in heating mode which has slightly higher noise output - taken as the 'worst case scenario'.

Unit Reference	Model	Overall dBA
AC-1-1	*Daikin RXS60F4V1B*	49
AC-1-2 & AC-G-2	*Daikin RZQG71L8V1B*	50
AC-1-3 & AC-1-4	*Daikin RXS50K2V1B*	48
AC-2-1	*Daikin RZQSG71L3V1B*	51
AC-2-2 & AC-2-3	*Daikin RXS35K2V1B*	48
VRV Condenser	*Daikin REYQ14P8Y1B*	62

Table 2: Equipment sound pressure level at 1m free-field *(manufacturer's noise data – heating mode)*

To calculate the overall noise contribution from the equipment to the nearest (non-associated) noise sensitive locations, a spreadsheet based noise model calculation has been used. The model takes account of the distance between the air conditioning equipment location (centre of the proposed plant area) and nearest noise sensitive locations, acoustic directivity (nil applied) and any natural line of sight acoustic screening (partially applied). Noise model calculations (without and with acoustic treatment applied) are provided in Appendix E.

Summary overall calculated noise levels from all nine units to the nearest noise sensitive (residential and commercial) locations compared with London Borough of Camden's overall dBA noise limit are shown in Table 3. Note the overall calculated noise levels in Table 3 are without any noise reduction treatment yet fitted to the equipment.

The acoustic calculations are considered extremely cautious for the following reasons:

- The calculation assumes all nine units are operating constantly all of the time in any 60 minute period in heating mode (higher noise output). In practice this type of air conditioning unit operates "on demand" and even when providing significant cooling / heating during the middle of a hot / cold day tend to operate only 60 to 70% of the time. It is extremely unlikely that all nine units would operate constantly for a full 60 minute period;

- The noise limits used for the assessment are cautiously based on the lowest measured background noise level over the complete noise survey period. Background noise levels for most of the time are higher and correspondingly for these times any equipment noise would be significantly lower than noise limits applicable to these times based on the background noise during these times.

- Cautiously the more onerous noise limit (15dBA below the lowest background noise level) of London Borough of Camden's planning consent noise conditions is applied to all nine units, whereas majority of the existing Daikin air conditioning units subject to this assessment generate a typically broadband type of noise (i.e. without any strong tonal or intermittent characteristics sufficient to attract attention).

Description	Equipment Overall Noise Level	London Borough of Camden Noise limit
Assessment Location 1: outside nearest residential windows at 154-156 Camden High Street (3rd floor)	37dBA	35dBA
Assessment Location 2: outside nearest commercial windows to rear of the buildings at Camden High Street (2nd floor)	37dBA	35dBA
Assessment Location 3: to commercial roof terrace to rear of the building at Camden High Street (1st floor)	32dBA	35dBA

Table 3: Equipment noise at nearest noise sensitive locations compared with noise limit

Table 3 shows that the overall noise from all nine equipment units (without any noise reduction treatment yet applied) although substantially below the minimum background noise slightly exceeds London Borough of Camden's noise limit requirement at Locations 1 & 2. Noise reduction treatment is required to one of the equipment items to comply with the noise requirement. Specification details for suitable noise reduction treatment are provided in Section 5.1 of this report.

5. RECOMMENDATIONS FOR NOISE AND VIBRATION TREATMENTS

Note that Philip Acoustics can only advise on noise and vibration issues and therefore it is recommended that professional advice from others may need to be sought to confirm suitability of the specified treatments with regard to non-acoustic issues such as airflow, structural support and any visual requirements.

Also, whilst this report is based on the specific make and model of Daikin air conditioning units as detailed in Section 4, if during installation or as part of future equipment replacement, alternative unit makes and/or models are selected then it is important that noise levels for the alternative equipment be checked by Philip Acoustics or another Acoustic Consultant to ensure the treatments specified below remain valid and noise emissions remain compliant with London Borough Of Camden requirements.

5.1 Noise

To fully comply with London Borough of Camden's noise limit requirements a noise reduction treatment is required to one of the existing equipment items – Daikin VRV Condenser Unit model REYQ14P8Y1B.

It is recommended that the most practicable way to reduce noise from this single condenser unit would be to install a proprietary acoustic screen to the unit.

It is recommended the acoustic screen is constructed using normal / standard type 50mm thick acoustic panels, being solid one side (minimum 20swg sheet steel) and perforated the other (typically perforated 22swg sheet steel) with 50mm thick acoustic grade mineral wool absorptive lining to form a 'U-shape' screen. The perforated side of the screen panels to face inwards towards the air conditioning unit. The screen should be positioned to form a 'barrier' between the unit and the nearest noise sensitive location (i.e. with its open side facing opposite direction – as shown on drawing in Appendix F). The height of the screen should be at least as high as the condenser unit itself.

The acoustic screen would typically be secured in place by brackets / channels and / or supported by suitably designed frame / support etc. Indication of the acoustic screen position is shown on a marked up drawing in Appendix F.

A data sheet for the example solid acoustic panel (by Allaway Acoustics) is also provided in Appendix F.

Details of possible acoustic hardware companies who could supply appropriate acoustic panels / screen are provided in Appendix G.

5.2 Vibration

Proposed new location of the equipment is not structurally linked to any adjacent residential properties and therefore there will be no potential for any structure-borne vibration from the equipment to transfer to adjacent residential properties. Nevertheless, it is anticipated the equipment (each unit separately) will be installed using vibration isolators as good practice.

It is recommended that the equipment units be mounted using proprietary rubber or neoprene turret type vibration isolators. The isolators should be selected to each have a static deflection not less than 5mm under load of each unit. Details of possible acoustic hardware companies who could supply appropriate vibration isolators are provided in Appendix G.

APPENDIX A

Noise Survey Instrumentation

Site: 4 Greenland Place, London NW1 0AP

Report: 17216-002 *Revision A* Appendix A

Date: December 2017

NOISE SURVEY INSTRUMENTATION

Five Day Background Noise Survey:

- Rion sound level meter type NL-31 Class 1 serial number 01193690 plus Rion microphone type UC-53A serial number 317534 complete with weatherproof and lockable outdoor environmental kit, microphone extension lead and extension boom arrangement;
- Bruel & Kjaer calibrator type 4231 serial number 2642929 (UKAS certified).

Sample Octave Band Values:

- Bruel & Kjaer sound level meter type 2260 serial number 2497368 plus Bruel & Kjaer microphone type 4189 serial number 2846933

APPENDIX B

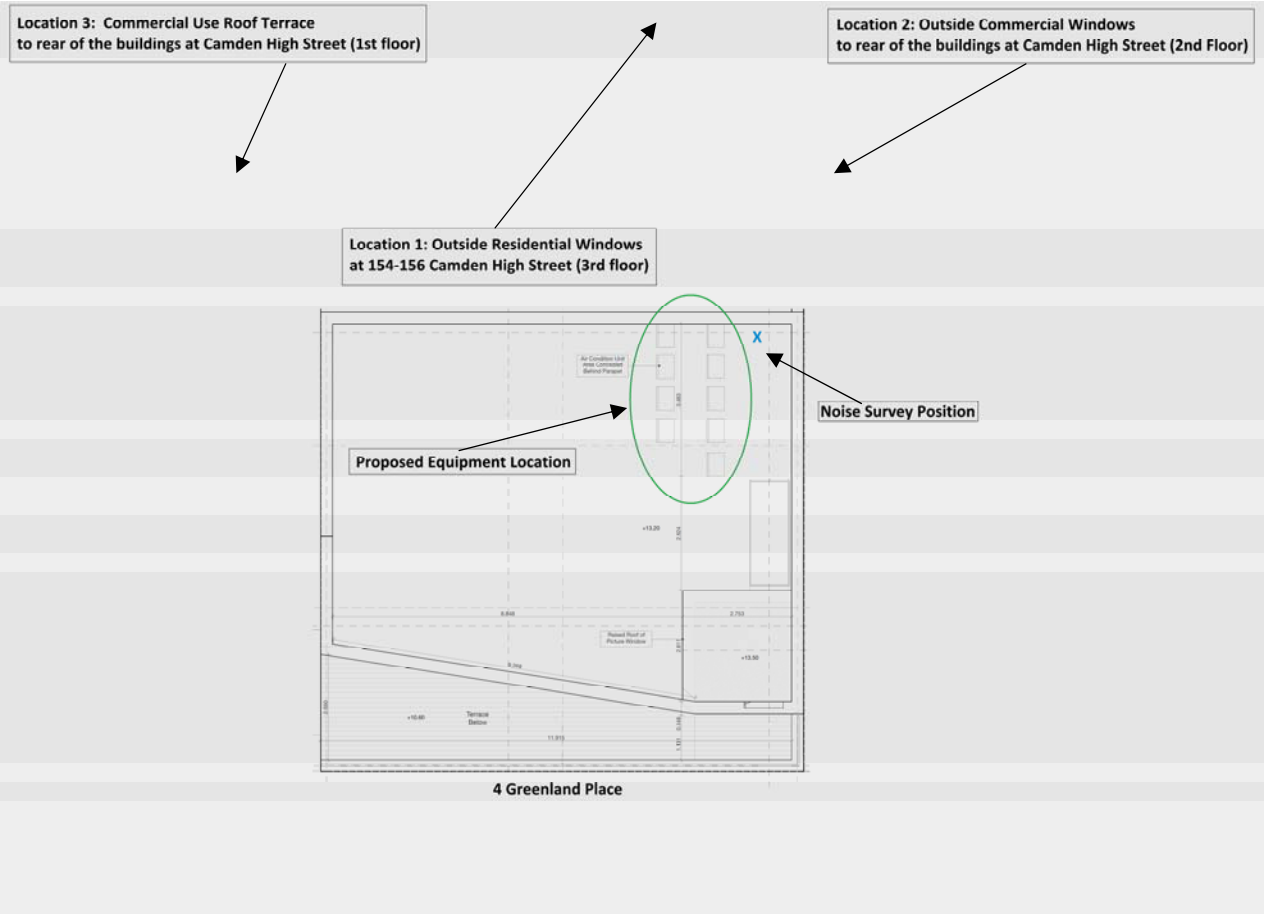
Drawing Showing Proposed Equipment Location

Site: 4 Greenland Place, London NW1 0AP

Report: 17216-002 *Revision A* Appendix B

Date: December 2017

DRAWING SHOWING PROPOSED EQUIPMENT LOCATION



APPENDIX C

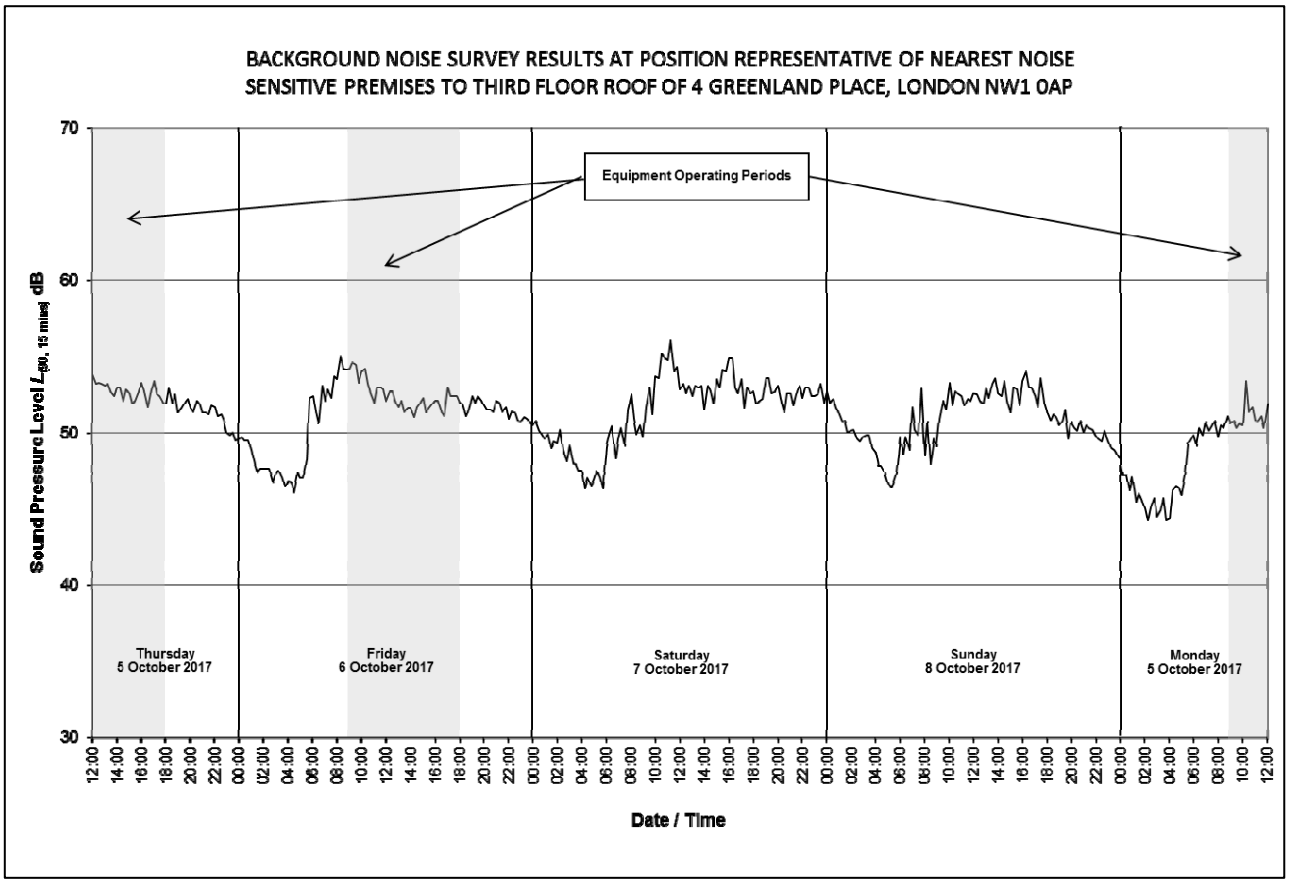
Background Noise Survey Results

Site: 4 Greenland Place, London NW1 0AP

Report: 17216-002 *Revision A* Appendix C

Date: December 2017

BACKGROUND NOISE SURVEY RESULTS



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APPENDIX D

Manufacturers Noise Data For Equipment

2 Specifications

2-7 Technical Specifications					RXS60F	RXS71F
Fan	Type				Propeller fan	
	Air flow rate	Cooling	High	m³/min	50.9	54.5
				cfm	1,797	1,924
			Nom.	m³/min	50.9	54.5
				cfm	1,797	1,924
			Low	m³/min	42.4	57.1
				cfm	1,496	1,624
			Super low	m³/min	-	
				cfm	-	
		Heating	High	m³/min	46.3	52.5
				cfm	1,635	1,854
			Low	m³/min	42.4	46.0
				cfm	1,496	1,624
			Super low	m³/min	-	
				cfm	-	
	Running current	Cooling	Low	A	8.23	9.71
			Standard	A	8.62	10.20
			High	A	9.01	10.59
		Heating	Low	A	8.41	10.44
			Standard	A	8.80	10.93
			High	A	9.19	11.42
	Power consumption	Cooling	Low	W	1,950	2,305
			Standard	W	1,950	2,305
			High	W	1,950	2,305
		Heating	Low	W	1,995	2,490
			Standard	W	1,995	2,490
			High	W	1,995	2,490
Fan motor	Model				KFD-380-50-8C	KFD-280-66-8A
	Output			W	53.00	66.00
	Speed	Cooling	High	rpm	810	860
			Low	rpm	680	730
			Super low	rpm	-	
		Heating	High	rpm	740	830
			Low	rpm	680	730
			Super low	rpm	-	
Sound power level	Cooling	Nom.		dBA	63	65
Sound pressure level	Cooling	High		dBA	49	52
		Low		dBA	46	49
	Heating	High		dBA	49	52
		Low		dBA	46	49
Operation range	Cooling	Ambient	Min.	°CDB	-10	
			Max.	°CDB	46	
	Heating	Ambient	Min.	°CWB	-15	
			Max.	°CWB	20	
Refrigerant	Type				R-410A	
	Charge			kg	1.5	2.3
	GWP				1,975	
Refrigerant oil	Type				FVC50K	
	Charged volume			l	0.65	0.75
Piping connections	Drain	ID		mm	-	
	Piping length	OU - IU	Max.	m	30	
		System	Chargeless	m	10	
	Level difference	IU - OU	Max.	m	20	

2 Specifications

2-1 Nominal Capacity And Nominal Input				FUQ71C/RZQG71L8V1	FUQ100C/RZQG100L8V1	FUQ125C/RZQG125L8V1
Nominal efficiency (cooling at 35°/27° nominal load, heating at 7°/20° nominal load)	EER			4.07	4.08	3.40
	COP			4.47	4.04	
	Annual energy consumption		kWh	840	1,230	1,770
	Energy label	Cooling		A		
		Heating		A		

2

Notes

(1) EER/COP according to Eurovent 2012

2-2 Technical Specifications					RZQG71L8V1	RZQG100L8V1	RZQG125L8V1	RZQG140L7V1
Capacity control	Method				Inverter controlled			
Casing	Colour				Ivory white			
	Material				Painted galvanized steel plate			
Dimensions	Unit	Height		mm	990	1,430		
		Width		mm	940			
		Depth		mm	320			
	Packed unit	Height		mm	1,170	1,610		
		Width		mm	1,015			
		Depth		mm	422			
Weight	Unit			kg	78	102		
	Packed unit			kg	88	115		
Heat exchanger	Fin	Type			WF fin			
		Treatment			Anti-corrosion treatment (PE)			
Compressor	Quantity				1			
	Type				Hermetically sealed swing compressor			
	Starting method				Inverter driven			
Fan	Type				Propeller fan			
	Discharge direction				Horizontal			
	Quantity				1	2		
	Air flow rate	Cooling	Nom.	m³/min	59	70		84
			Super low	m³/min	-			
				cfm	-			
		Heating	Nom.	m³/min	49	62		
			Super low	m³/min	-			
				cfm	-			
Fan motor	Quantity				1	2		
	Model				Brushless DC motor			
	Output			W	94			
	Drive				Direct drive			
	Speed	Cooling	Super low	rpm	-			
		Heating	Super low	rpm	-			
Sound power level	Cooling	Nom.		dBA	64	66	67	69
Sound pressure level	Cooling	Nom.		dBA	48	50	51	52
	Heating	Nom.		dBA	50	52	53	
	Night quiet mode	Level 1		dBA	43	45		
Operation range	Cooling	Ambient	Min.	°CDB	-15			
			Max.	°CDB	50			
	Heating	Ambient	Min.	°CWB	-20			
			Max.	°CWB	15.5			
Refrigerant	Type				R-410A			
	Charge			kg	2.9	4.0		
	Control				Expansion valve (electronic type)			
	GWP				1,975			
	Circuits	Quantity			1			

2 Specifications

2-9 Technical Specifications					RXS20K	RXS25K	RXS35K	RXS42K	RXS50K
Capacity control	Method				Inverter controlled				
Casing	Colour				Ivory white				
Dimensions	Unit	Height		mm	550				735
		Width		mm	765				825
		Depth		mm	285				300
	Packed unit	Height		mm	612				797
		Width		mm	906				992
		Depth		mm	364				390
Weight	Unit			kg	34			39	47
	Packed unit			kg	38			45	52
Heat exchanger	Length			mm	805			810	845
	Rows	Quantity			2				
	Fin pitch			mm	1.4			1.5	1.8
	Stages	Quantity			24				32
	Tube type				ø7 Hi-XA			ø8 Hi-XA	
	Fin	Type			Waffle louvered fin		WF fin	Precoat Fin	
Compressor	Model				1YC23AEXD		1YC23AEXDC	2YC36BXD#C	
	Type				Hermetically sealed swing compressor				
	Output			W	600			1,100	
Fan	Type				Propeller fan				
	Air flow rate	Cooling	High	m³/min	33.5		36.0	37.3	50.9
				cfm	1,183		1,271	1,317	1,797
			Nom.	m³/min	33.5		36.0	37.3	50.9
				cfm	1,183		1,271	1,317	1,797
			Low	m³/min	30.1		-		
				cfm	1,063		-		
			Super low	m³/min	-		30.1	30.6	48.9
				cfm	-		1,063	1,080	1,727
		Heating	High	m³/min	28.3			31.3	45.0
				cfm	999			1,105	1,589
			Low	m³/min	25.6		-		
				cfm	904		-		
			Super low	m³/min	-		25.6	27.2	43.1
				cfm	-		904	960	1,522
Fan motor	Model				D23H-28			D50R-28	KFD-380-50-8D
	Output			W	23			50	53
	Speed	Cooling	High	rpm	860		920	890	780
			Super low	rpm	780			790	670
		Heating	High	rpm	860			890	720
			Super low	rpm	740			780	670
Sound power level	Cooling	Nom.		dBA	61	62	-		
		High		dBA	-		63		
Sound pressure level	Cooling	High		dBA	46		48		
		Silent operation		dBA	43		44		
	Heating	High		dBA	47		48		
		Silent operation		dBA	44		45		
Operation range	Cooling	Ambient	Min.	ºCDB	-10				
			Max.	ºCDB	46				
	Heating	Ambient	Min.	ºCWB	-15				
			Max.	ºCWB	18				
Refrigerant	Type				R-410A				
	Charge			kg	1.0		1.2	1.3	1.7
	GWP				1,975				
Refrigerant oil	Type				FVC50K				
	Charged volume			l	0.375			0.650	

2 Specifications

2-2 Technical Specifications					RZQSG71L3V1	RZQSG100L8V1	RZQSG125L8V1	RZQSG140LV1
Heat exchanger	Length			mm	857	-		
	Rows	Quantity			2	-		
	Fin pitch			mm	1.4	-		
	Passes	Quantity			8	-		
	Face area			m²	0.641	-		
	Stages	Quantity			34	-		
	Empty tubeplate hole	Quantity			0	-		
	Tube type				ø8 Hi-XSS	-		
	Fin	Type			WF fin			
		Treatment			Anti-corrosion treatment (PE)			
Compressor	Quantity				1			
	Model				2YC63DXD	-		
	Type				Hermetically sealed swing compressor			
	Output			W	1,700	-		
	Starting method				Inverter driven			
Fan	Type				Propeller fan			
	Discharge direction				Horizontal			
	Quantity				1			2
	Air flow rate	Cooling	Nom.	m³/min	52	76	77	83
			Super low	m³/min	-			
				cfm	-			
		Heating	Nom.	m³/min	48	83		62
			Super low	m³/min	-			
				cfm	-			
Fan motor	Quantity				1			2
	Model				KFD-325-70-8A	Brushless DC motor		
	Output			W	70	200		94
	Drive				Direct drive			
	Speed	Steps			8	-		
		Cooling	Nom.	rpm	800	-		
			Super low	rpm	-			
		Heating	Nom.	rpm	745	-		
			Super low	rpm	-			
Sound power level	Cooling	Nom.		dBA	65	69	70	69
Sound pressure level	Cooling	Nom.		dBA	49	53	54	53
		Silent operation		dBA	47	49		
	Heating	Nom.		dBA	51	57	58	54
Operation range	Cooling	Ambient	Min.	°CDB	-5.0			
			Max.	°CDB	46			
	Heating	Ambient	Min.	°CWB	-15			
			Max.	°CWB	15.5			
Refrigerant	Type				R-410A			
	Charge			kg	2.75	2.9		4.0
	Control				Expansion valve (electronic type)			
	GWP				1,975			
	Circuits	Quantity			1			
Refrigerant oil	Type				FVC50K			
	Charged volume			l	0.75	0.9		1.35

2 Specifications

2-3 Technical Specifications					RX20K	RX25K	RX35K	RX50K	RX60K
Dimensions	Unit	Height		mm	550			735	
		Width		mm	658			870	
		Depth		mm	275			320	
	Packed unit	Height		mm	616			810	
		Width		mm	790			1,055	
		Depth		mm	360			444	
Weight	Unit			kg	28			44	49
	Packed unit			kg	31			48	53
Packing	Weight			kg	3			4	
Heat exchanger	Length			mm	670		647	943	920
	Rows	Quantity			1		2	1	2
	Fin pitch			mm	1.4				
	Stages	Quantity			24			32	
	Tube type				ø7 Hi-XA			ø7 Hi-XD	
	Fin	Type			Waffle louvered fin				
Compressor	Model				1YC23AUXDC			2YC36PXD	
	Type				Hermetically sealed swing compressor				
	Output			W	750			1,100	
Fan	Type				Propeller fan				
	Air flow rate	Cooling	High	m^3/min	29.2		27.6	63.8	62.7
				cfm	1,030		975	2,253	2,214
			Super low	m^3/min	-			51.3	-
				cfm	-			1,812	-
		Heating	High	m^3/min	26.2		24.5	58.0	57.9
				cfm	927		865	2,048	2,045
			Super low	m^3/min	-			51.3	-
				cfm	-			1,812	-
Fan motor	Model				D50Q-28			D90B-37	
	Output			W	50			58	
	Speed	Cooling	High	rpm	840			710	
			Low	rpm	720			630	
			Super low	rpm	-				
		Heating	High	rpm	840			710	780
			Low	rpm	720			630	680
			Super low	rpm	-				
Sound power level	Cooling			dBA	60		62	61	63
	Heating			dBA	61		62		63
Sound pressure level	Cooling	High		dBA	46		48	47	49
	Heating	High		dBA	47		48		49
Operation range	Cooling	Ambient	Min.	°CDB	-10			-10	
			Max.	°CDB	46				
	Heating	Ambient	Min.	°CWB	-15				
			Max.	°CWB	18				
Refrigerant	Type				R-410A				
	Charge			kg	0.74		1.0	1.13	1.45
				TCO_2eq	1.5		2.1	2.4	3.0
	GWP				2,087.5				
Refrigerant oil	Type				FVC50K				
	Charged volume			l	0.375			0.636	

2 Specifications

VRV Condenser

2-1 Technical Specifications					REYQ8P9	REYQ10P8	REYQ12P9	REYQ14P8	REYQ16P8
Capacity range				HP	8	10	12	14	16
Cooling capacity	Nom.			kW	22.4 (1)	28.0 (1)	33.5 (1)	40.0 (1)	45.0 (1)
Heating capacity	Nom.			kW	25.0 (2)	31.5 (2)	37.5 (2)	45.0 (2)	50.0 (2)
Capacity control	Steps			%	20 ~ 100	14 ~ 100		10 ~ 100	
Power input - 50Hz	Cooling	Nom.		kW	5.20	7.09	8.72	11.4	14.1
	Heating	Nom.		kW	5.71	7.38	8.84	11.0	12.8
EER					4.31	3.95	3.84	3.51	3.19
COP					4.38	4.27	4.24	4.09	3.91
Maximum number of connectable indoor units					17	21	26	30	34
Indoor index connection	Min.				100	125	150	175	200
	Nom.				200	250	300	350	400
	Max.				260	325	390	455	520
Dimensions	Unit	Height		mm	1,680				
		Width		mm	1,300				
		Depth		mm	765				
Weight	Unit			kg	331			339	
Heat exchanger	Type				Cross fin coil				
Compressor	Quantity				2				
	Type				Hermetically sealed scroll compressor				
	Piston displacement			m³/h	7.88	13.34		16.90	
	Speed			rpm	3,720	6,300		7,980	
	Output			W	1,000	2,200	3,300	3,800	4,400
	Starting method				Soft start				
Compressor 2	Type				Hermetically sealed scroll compressor				
	Piston displacement			m³/h	10.53			16.90	
	Speed			rpm	2,900			7,980	
	Output			W	4,500			3,800	4,400
	Starting method				Soft start				
Fan	Type				Propeller fan				
	Air flow rate	Cooling	Nom.	m³/min	190		210	235	240
	External static pressure	Max.		Pa	-				
Fan motor	Quantity				2				
	Drive				Direct drive				
	Output			W	350.00			750.00	
Fan motor 2	Drive				Direct drive				
	Output			W	350.00			750.00	
Sound power level	Cooling	Nom.		dBA	78		80	83	84
Sound pressure level	Cooling	Nom.		dBA	58		60	62	63
Operation range	Cooling	Min.~Max.		ºCDB	-20 (15) / -5~43				
	Heating	Min.~Max.		ºCWB	-20~15.5				
Refrigerant	Type				R-410A				
	Charge			kg	10.3	10.6	10.8	11.1	
	Control				Expansion valve (electronic type)				

APPENDIX E

Noise Model Calculations

Site: 4 Greenland Place, London NW1 0AP

Ref: 17216-002 Revision A Appendix E *(page 1 of 6)*

Date: December 2017

NOISE MODEL CALCULATIONS

ASSESSMENT LOCATION 1: To outside nearest noise sensitive residential windows at 154-156 Camden High St.

NOISE CONDITION: All 9 x Daikin units operating simultaneously in heating mode.

NOISE MITIGATION: None fitted

Equipment	Equipment Sound Pressure Level Lp dBA *(1)*	Correction for noise attenuation dBA *(2)*	Distance to assesment position m *(3)*	Correction for distance to assessment position dBA *(4)*	Correction for line of sight screening dBA *(5)*	Correction for acoustic directivity dBA *(6)*	Individual Contributions dB
New External Plant Area							
AC-1-1 *(Daikin RXS60F4V1B)*	49	0	22	-27	0	0	22.2
AC-1-2 *(Daikin RZQG71L8V1B)*	50	0	22	-27	0	0	23.2
AC-1-3 *(Daikin RXS50K2V1B)*	48	0	22	-27	0	0	21.2
AC-1-4 *(Daikin RXS50K2V1B)*	48	0	22	-27	0	0	21.2
AC-2-1 *(Daikin RZQSG71L3V1B)*	51	0	22	-27	0	0	24.2
AC-2-2 *(Daikin RXS35K2V1B)*	48	0	22	-27	0	0	21.2
AC-2-3 *(Daikin RXS35K2V1B)*	48	0	22	-27	0	0	21.2
AC-G-2 *(Daikin RZQG71L8V1B)*	50	0	22	-27	0	0	23.2
VRV Condenser (*Daikin REYQ14P8Y1B*)	62	0	22	-27	0	0	35.2
Overall SPL from sources at assessment position:	**37 dBA** *(7)*						

Notes:

Note 1: Free-field overall dBA sound pressure level at 1m based on manufacturer noise data.

Note 2: No noise reduction treatment fitted to units.

Note 3: Distance is from center of sound sources (plant area) to receiving position (outside nearest residential windows).

Note 4: Correction for additional distance between sound sources and receiving position (outside residential windows).

Note 5: Cautiously no line of sight acoustic screening benefit is allowed for.

Note 6: Cautiously no directivity correction is allowed for.

Note 7: Overall predicted sound pressure level at assessment Location 1 due to all equipment units operating simultaneously is 37dBA which exceeds London Borough Of Camden's noise limit requirement (≤ 35dBA).

Site: 4 Greenland Place, London NW1 0AP

Ref: 17216-002 Revision A Appendix E *(page 2 of 6)*

Date: December 2017

NOISE MODEL CALCULATIONS

ASSESSMENT LOCATION 1: To outside nearest noise sensitive residential windows at 154-156 Camden High St.

NOISE CONDITION: All 9 x Daikin units operating simultaneously in heating mode.

NOISE MITIGATION: Acoustic screen fitted to VRV Condenser (see Section 5.1 of Report 17216-002 Revision A)

Equipment	Equipment Sound Pressure Level Lp dBA *(1)*	Correction for noise attenuation dBA *(2)*	Distance to assesment position m *(3)*	Correction for distance to assessment position dBA *(4)*	Correction for line of sight screening dBA *(5)*	Correction for acoustic directivity dBA *(6)*	Individual Contributions dB
New External Plant Area							
AC-1-1 *(Daikin RXS60F4V1B)*	49	0	22	-27	0	0	22.2
AC-1-2 *(Daikin RZQG71L8V1B)*	50	0	22	-27	0	0	23.2
AC-1-3 *(Daikin RXS50K2V1B)*	48	0	22	-27	0	0	21.2
AC-1-4 *(Daikin RXS50K2V1B)*	48	0	22	-27	0	0	21.2
AC-2-1 *(Daikin RZQSG71L3V1B)*	51	0	22	-27	0	0	24.2
AC-2-2 *(Daikin RXS35K2V1B)*	48	0	22	-27	0	0	21.2
AC-2-3 *(Daikin RXS35K2V1B)*	48	0	22	-27	0	0	21.2
AC-G-2 *(Daikin RZQG71L8V1B)*	50	0	22	-27	0	0	23.2
VRV Condenser (*Daikin REYQ14P8Y1B*)	62	-10	22	-27	0	0	25.2
Overall SPL from sources at assessment position:	**32 dBA** *(7)*						

Notes:

Note 1: Free-field overall dBA sound pressure level at 1m based on manufacturer noise data.

Note 2: Acoustic screen (see Section 5.1 of Report 17216-002 Revision A). Acoustic screen attenuates noise by -10dBA.

Note 3: Distance is from center of sound sources (plant area) to receiving position (outside nearest residential windows).

Note 4: Correction for additional distance between sound sources and receiving position (outside residential windows).

Note 5: Cautiously no line of sight acoustic screening benefit is allowed for.

Note 6: Cautiously no directivity correction is allowed for.

Note 7: Overall predicted sound pressure level at assessment Location 1 due to all equipment units operating simultaneously (with noise reduction fitted to VRV Condenser unit) is 32dBA which complies with London Borough Of Camden's noise limit requirement (≤ 35dBA).

Site: 4 Greenland Place, London NW1 0AP

Ref: 17216-002 Revision A Appendix E *(page 3 of 6)*

Date: December 2017

NOISE MODEL CALCULATIONS

ASSESSMENT LOCATION 2: To outside nearest commercial windows to rear of buildings at Camden High St.

NOISE CONDITION: All 9 x Daikin units operating simultaneously in heating mode.

NOISE MITIGATION: None fitted

Equipment	Equipment Sound Pressure Level Lp dBA *(1)*	Correction for noise attenuation dBA *(2)*	Distance to assesment position m *(3)*	Correction for distance to assessment position dBA *(4)*	Correction for line of sight screening dBA *(5)*	Correction for acoustic directivity dBA *(6)*	Individual Contributions dB
New External Plant Area							
AC-1-1 *(Daikin RXS60F4V1B)*	49	0	13	-22	0	0	26.7
AC-1-2 *(Daikin RZQG71L8V1B)*	50	0	13	-22	0	0	27.7
AC-1-3 *(Daikin RXS50K2V1B)*	48	0	13	-22	0	0	25.7
AC-1-4 *(Daikin RXS50K2V1B)*	48	0	13	-22	0	0	25.7
AC-2-1 *(Daikin RZQSG71L3V1B)*	51	0	13	-22	-5	0	23.7
AC-2-2 *(Daikin RXS35K2V1B)*	48	0	13	-22	-5	0	20.7
AC-2-3 *(Daikin RXS35K2V1B)*	48	0	13	-22	-5	0	20.7
AC-G-2 *(Daikin RZQG71L8V1B)*	50	0	13	-22	-5	0	22.7
VRV Condenser (*Daikin REYQ14P8Y1B*)	62	0	13	-22	-5	0	34.7
Overall SPL from sources at assessment position:	**37 dBA** *(7)*						

Notes:

Note 1: Free-field overall dBA sound pressure level at 1m based on manufacturer noise data.

Note 2: No noise reduction treatment fitted to units.

Note 3: Distance is from center of sound sources (plant area) to receiving position (outside nearest residential windows).

Note 4: Correction for additional distance between sound sources and receiving position (outside residential windows).

Note 5: Cautiously only partial line of sight acoustic screening benefit is allowed for.

Note 6: Cautiously no directivity correction is allowed for.

Note 7: Overall predicted sound pressure level at assessment Location 2 due to all equipment units operating simultaneously is 37dBA which exceeds London Borough Of Camden's noise limit requirement (≤ 35dBA).

Site: 4 Greenland Place, London NW1 0AP

Ref: 17216-002 Revision A Appendix E *(page 4 of 6)*

Date: December 2017

NOISE MODEL CALCULATIONS

ASSESSMENT LOCATION 2: To outside nearest commercial windows to rear of buildings at Camden High St.

NOISE CONDITION: All 9 x Daikin units operating simultaneously in heating mode.

NOISE MITIGATION: Acoustic screen fitted to VRV Condenser (see Section 5.1 of Report 17216-002 Revision A)

Equipment	Equipment Sound Pressure Level Lp dBA *(1)*	Correction for noise attenuation dBA *(2)*	Distance to assesment position m *(3)*	Correction for distance to assessment position dBA *(4)*	Correction for line of sight screening dBA *(5)*	Correction for acoustic directivity dBA *(6)*	Individual Contributions dB
New External Plant Area							
AC-1-1 *(Daikin RXS60F4V1B)*	49	0	13	-22	0	0	26.7
AC-1-2 *(Daikin RZQG71L8V1B)*	50	0	13	-22	0	0	27.7
AC-1-3 *(Daikin RXS50K2V1B)*	48	0	13	-22	0	0	25.7
AC-1-4 *(Daikin RXS50K2V1B)*	48	0	13	-22	0	0	25.7
AC-2-1 *(Daikin RZQSG71L3V1B)*	51	0	13	-22	-5	0	23.7
AC-2-2 *(Daikin RXS35K2V1B)*	48	0	13	-22	-5	0	20.7
AC-2-3 *(Daikin RXS35K2V1B)*	48	0	13	-22	-5	0	20.7
AC-G-2 *(Daikin RZQG71L8V1B)*	50	0	13	-22	-5	0	22.7
VRV Condenser (*Daikin REYQ14P8Y1B*)	62	-10	13	-22	-5	0	24.7
Overall SPL from sources at assessment position:	**34 dBA** *(7)*						

Notes:

Note 1: Free-field overall dBA sound pressure level at 1m based on manufacturer noise data.

Note 2: Acoustic screen (see Section 5.1 of Report 17216-002 Revision A). Acoustic screen attenuates noise by -10dBA.

Note 3: Distance is from center of sound sources (plant area) to receiving position (outside nearest residential windows).

Note 4: Correction for additional distance between sound sources and receiving position (outside residential windows).

Note 5: Cautiously only partial line of sight acoustic screening benefit is allowed for.

Note 6: Cautiously no directivity correction is allowed for.

Note 7: Overall predicted sound pressure level at assessment Location 2 due to all equipment units operating simultaneously (with noise reduction fitted to VRV Condenser unit) is 34dBA which complies with London Borough Of Camden's noise limit requirement (≤ 35dBA).

Site: 4 Greenland Place, London NW1 0AP

Ref: 17216-002 Revision A Appendix E *(page 5 of 6)*

Date: December 2017

NOISE MODEL CALCULATIONS

ASSESSMENT LOCATION 3: To commercial roof terrace to rear of buildings at Camden High St.

NOISE CONDITION: All 9 x Daikin units operating simultaneously in heating mode.

NOISE MITIGATION: None fitted

Equipment	Equipment Sound Pressure Level Lp dBA *(1)*	Correction for noise attenuation dBA *(2)*	Distance to assesment position m *(3)*	Correction for distance to assessment position dBA *(4)*	Correction for line of sight screening dBA *(5)*	Correction for acoustic directivity dBA *(6)*	Individual Contributions dB
New External Plant Area							
AC-1-1 *(Daikin RXS60F4V1B)*	49	0	17	-25	0	0	24.4
AC-1-2 *(Daikin RZQG71L8V1B)*	50	0	17	-25	0	0	25.4
AC-1-3 *(Daikin RXS50K2V1B)*	48	0	17	-25	0	0	23.4
AC-1-4 *(Daikin RXS50K2V1B)*	48	0	17	-25	0	0	23.4
AC-2-1 *(Daikin RZQSG71L3V1B)*	51	0	17	-25	-10	0	16.4
AC-2-2 *(Daikin RXS35K2V1B)*	48	0	17	-25	-10	0	13.4
AC-2-3 *(Daikin RXS35K2V1B)*	48	0	17	-25	-10	0	13.4
AC-G-2 *(Daikin RZQG71L8V1B)*	50	0	17	-25	-10	0	15.4
VRV Condenser (*Daikin REYQ14P8Y1B*)	62	0	17	-25	-10	0	27.4
Overall SPL from sources at assessment position:	**32 dBA** *(7)*						

Notes:

Note 1: Free-field overall dBA sound pressure level at 1m based on manufacturer noise data.

Note 2: No noise reduction treatment fitted to units.

Note 3: Distance is from center of sound sources (plant area) to receiving position (outside nearest residential windows).

Note 4: Correction for additional distance between sound sources and receiving position (outside residential windows).

Note 5: Cautiously only partial line of sight acoustic screening benefit is allowed for.

Note 6: Cautiously no directivity correction is allowed for.

Note 7: Overall predicted sound pressure level at assessment Location 3 due to all equipment units operating simultaneously is 32dBA which complies with London Borough Of Camden's noise limit requirement (≤ 35dBA).

Site: 4 Greenland Place, London NW1 0AP

Ref: 17216-002 Revision A Appendix E *(page 6 of 6)*

Date: December 2017

NOISE MODEL CALCULATIONS

ASSESSMENT LOCATION 3: To commercial roof terrace to rear of buildings at Camden High St.

NOISE CONDITION: All 9 x Daikin units operating simultaneously in heating mode.

NOISE MITIGATION: Acoustic screen fitted to VRV Condenser (see Section 5.1 of Report 17216-002 Revision A)

Equipment	Equipment Sound Pressure Level Lp dBA *(1)*	Correction for noise attenuation dBA *(2)*	Distance to assesment position m *(3)*	Correction for distance to assessment position dBA *(4)*	Correction for line of sight screening dBA *(5)*	Correction for acoustic directivity dBA *(6)*	Individual Contributions dB
New External Plant Area							
AC-1-1 *(Daikin RXS60F4V1B)*	49	0	17	-25	0	0	24.4
AC-1-2 *(Daikin RZQG71L8V1B)*	50	0	17	-25	0	0	25.4
AC-1-3 *(Daikin RXS50K2V1B)*	48	0	17	-25	0	0	23.4
AC-1-4 *(Daikin RXS50K2V1B)*	48	0	17	-25	0	0	23.4
AC-2-1 *(Daikin RZQSG71L3V1B)*	51	0	17	-25	-10	0	16.4
AC-2-2 *(Daikin RXS35K2V1B)*	48	0	17	-25	-10	0	13.4
AC-2-3 *(Daikin RXS35K2V1B)*	48	0	17	-25	-10	0	13.4
AC-G-2 *(Daikin RZQG71L8V1B)*	50	0	17	-25	-10	0	15.4
VRV Condenser (*Daikin REYQ14P8Y1B*)	62	-10	17	-25	-10	0	17.4
Overall SPL from sources at assessment position:	**31 dBA** *(7)*						

Notes:

Note 1: Free-field overall dBA sound pressure level at 1m based on manufacturer noise data.

Note 2: Acoustic screen (see Section 5.1 of Report 17216-002 Revision A). Acoustic screen attenuates noise by -10dBA.

Note 3: Distance is from center of sound sources (plant area) to receiving position (outside nearest residential windows).

Note 4: Correction for additional distance between sound sources and receiving position (outside residential windows).

Note 5: Cautiously only partial line of sight acoustic screening benefit is allowed for.

Note 6: Cautiously no directivity correction is allowed for.

Note 7: Overall predicted sound pressure level at assessment Location 3 due to all equipment units operating simultaneously (with noise reduction fitted to VRV Condenser unit) is 31dBA which complies with London Borough Of Camden's noise limit requirement (≤ 35dBA).

APPENDIX F

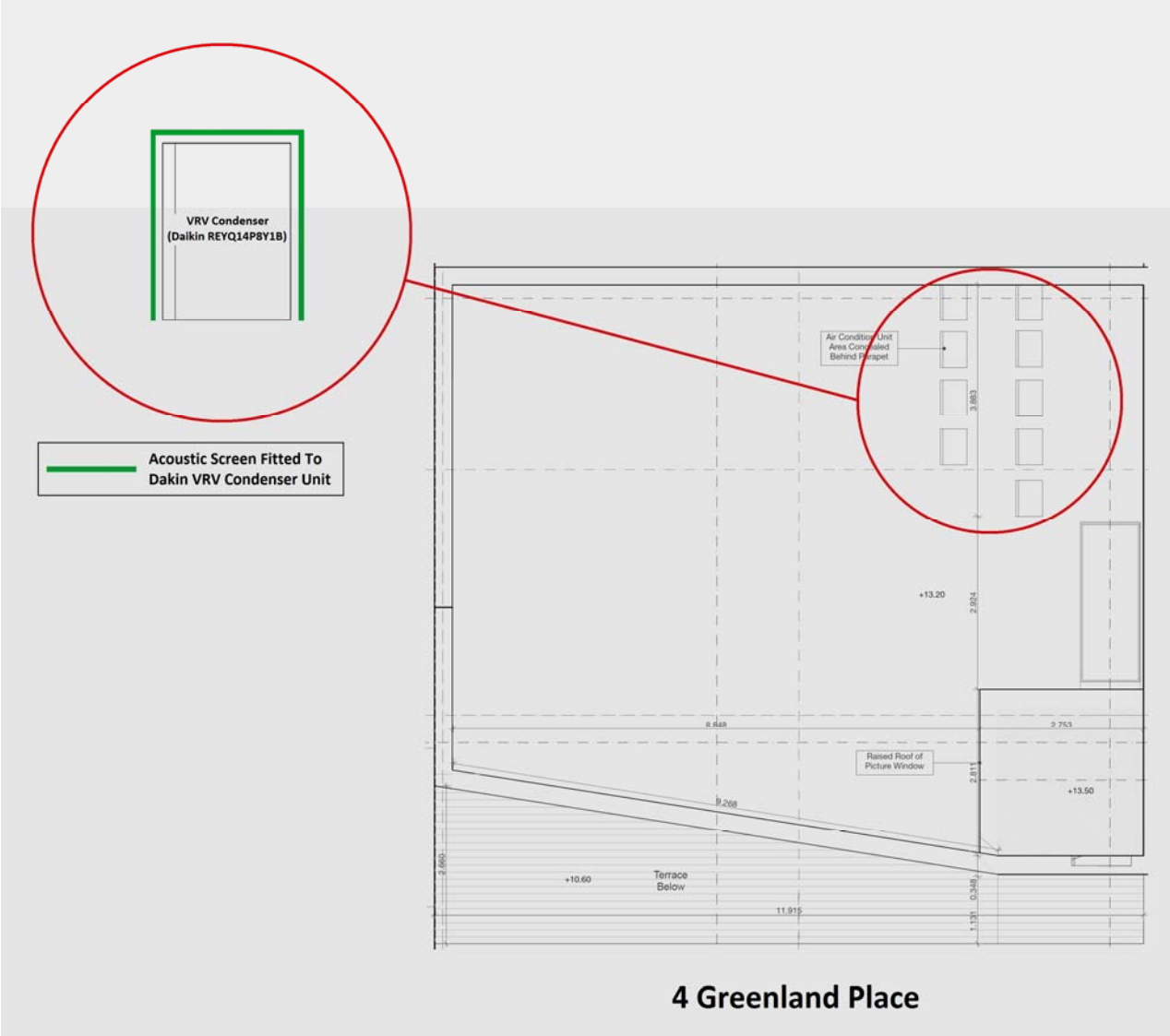
Noise Reduction Treatment

Site: 4 Greenland Place, London NW1 0AP

Report: 17216-002 *Revision A* Appendix F

Date: December 2017

DRAWING SHOWING NOISE REDUCTION TREATMENT (ACOUSTIC SCREEN) APPLIED TO EQUIPMENT ITEM



PHILIP ACOUSTICS LTD

107 Bancroft, Hitchin, Hertfordshire, SG5 1NB Tel: 01462 431877

E-mail: admin@philipacoustics.co.uk

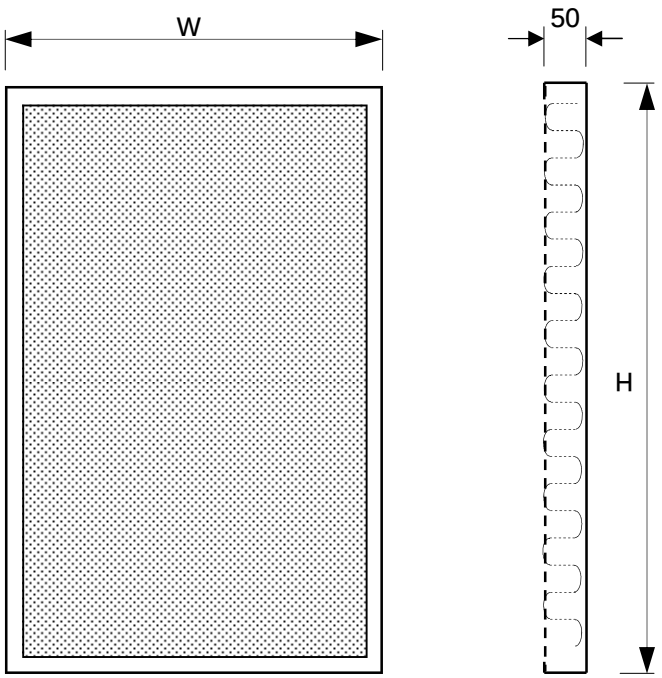
Member of The Association of Noise Consultants Registered in England No.: 4560265

DATA SHEET E40D

ACOUSTIC ENCLOSURE PANEL MODEL EP50/UF

IMPORTANT : THIS IS NOT A STAND ALONE DOCUMENT AND UNLESS REFERRED TO IN A DATED AND CERTIFIED EQUIPMENT SCHEDULE IS SUBJECT TO REVISION WITHOUT NOTICE.

DIMENSIONS



ACOUSTIC PERFORMANCE

SOUND REDUCTION INDEX BS EN ISO 10140/2 : 2010

63	125	250	500	1000	2000	4000	8000	HZ
17	19	26	33	38	42	45	44	dB

SOUND ABSORPTION BS EN ISO 354 : 2003

63	125	250	500	1000	2000	4000	8000	HZ
.10	.25	.65	1.00	1.00	1.00	.95	.90	-

NOTES

THIS DATA SHEET IS TO BE READ IN CONJUNCTION WITH THE EQUIPMENT SCHEDULE

PANELS WILL BE SUPPLIED WITHOUT SUPPORT STEELWORK, BRACKETS, FIXINGS OR MASTIC UNLESS OTHERWISE STATED.

PANELS MORE THAN 1800 WIDE OR 2500 HIGH MAY BE MANUFACTURED IN SECTIONS FOR ON SITE ASSEMBLY.

SPECIFICATION

THE ACOUSTIC ENCLOSURE PANEL COMPRISES A COMBINATION OF SOUND ABSORBENT MATERIALS AND HIGH MASS BARRIERS CONTAINED WITHIN A METAL CASING HAVING AN PLAIN OUTER AND PERFORATED INNER FACE, OFFERING EXCELLENT SOUND REDUCTION AND ABSORPTION PROPERTIES.

PANELS ARE CONSTRUCTED FROM PRE-GALVANISED SHEET STEEL AS STANDARD.

THE OUTER CASING IS FORMED FROM PLAIN SHEET METAL AND INSIDE FACE FROM PERFORATED METAL.

PANELS CONTAIN A FIBROUS SOUND ABSORBENT INFILL THAT IS NON-SHEDDING, NON-COMBUSTIBLE, NON-HYGROSCOPIC AND CHEMICALLY INERT. THE INFILL IS FACED WITH GLASS CLOTH TO PREVENT FIBRE MIGRATION.

THE CASING CAN BE SUPPLIED WITH A PERIMETER FLANGE FOR FIXING ADJACENT SECTIONS TOGETHER, FIXING THE PANELS INTO THE BUILDERSWORK OPENING OR FIXING INTO THE FRAMEWORK OF AN ACOUSTIC ENCLOSURE (OPTION F).

POLYESTER POWDER FINISH AVAILABLE (SUFFIX P)

SUFFIX

P - POLYESTER POWDER COAT

F - PERIPHERAL FIXING FRAME

X - SPECIAL CONSTRUCTION, REFER TO EQUIPMENT SCHEDULE FOR DETAILS.

BUILDERSWORK

THE W AND H DIMENSIONS GIVEN ON THE CERTIFIED EQUIPMENT SCHEDULE ARE AS MANUFACTURED.

ADEQUATE CLEARANCE MUST BE ALLOWED WHEN CONSTRUCTING THE BUILDERSWORK OPENING, MIN 10mm IS RECOMMENDED.

WEIGHT

ACTUAL WEIGHTS ARE GIVEN ON THE EQUIPMENT SCHEDULE.

APPROXIMATE WEIGHT: 38kg/M^2.

STANDARD SIZES

THERE ARE NO STANDARD SIZES. PANELS ARE MANUFACTURED TO ORDER

ALLAWAY ACOUSTICS LIMITED Old Police Station, 1 Queens Road, Hertford SG14 1EN
T | 01992 550825 E | enquiries@allawayacoustics.co.uk W | allawayacoustics.co.uk

APPENDIX G

Supplier Details For Noise & Vibration Treatments

Site: 4 Greenland Place, London NW1 0AP

Report: 17216-002 *Revision A* Appendix G

Date: December 2017

DETAILS OF POSSIBLE ACOUSTIC HARDWARE SUPPLIERS

NOISE REDUCTION TREATMENT

Not listed in any order of recommendation or preference

- Allaway Acoustics: 01992 550825, www.allawayacoustics.co.uk
- AG Fabrications Ltd: 01268 785365, www.agfabrications.co.uk
- Environmental Equipment Corporation Ltd: 01932 230940, www.eecnoisecontrol.co.uk
- EMTEC: 020 8848 3031, www.emtecproducts.co.uk

VIBRATION ISOLATORS

Not listed in any order of recommendation or preference

- Allaway Acoustics: 01992 550825, www.allawayacoustics.co.uk
- EMTEC: 020 8848 3031, www.emtecproducts.co.uk
- Christie & Grey: 01732 371100, www.christiegrey.com