Noise & Vibration Consultants
4 Mulberry Place, Pinnell Road, London, SE9 6AR
Tel: 020 8859 0303
Email: **info@acousticsplus.co.uk** Web: www.acousticsplus.co.uk

ACOUSTICS PLUS

Proposed Installation of Mechanical Plant

Phyllis Court, 22 Rosecroft Avenue, London, NW3.

Environmental Noise Assessment

Author: Andy Dodd B.Sc. (Hons) MIOA
Senior Consultant

Doc Ref: 104034.ad.Issue3

Company Registration Number: 4304440
VAT Registration Number: 788 2610 94

Proposed Installation of Mechanical Plant	
Project Address:	Phyllis Court, 22 Rosecroft Avenue Hampstead NW3
Project Reference:	104034

Issue/Revision Record			
Issue:	**Date:**	**Remarks:**	**Author:**
1	29/09/2020	First Issue	Andy Dodd
2	02/10/2020	Second Issue - Clarification	Andy Dodd
3	07/10/2020	Third Issue	Andy Dodd

	Signature:	Print:	Title:	Date:
Author:		**Andy Dodd**	**Senior Consultant**	**07/10/2020**
Reviewer:		**Phil Huffer**	**Principal Consultant**	**07/10/2020**

1. INTRODUCTION

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

1.2 APL has been instructed by the applicant's Agent, DFT Property Management Ltd, to consider and advise upon the noise implications of the proposed installation of an air source heat pump (ASHP) and pool plant. The ASHP system will consist of 1No. external unit located within an open topped enclosure adjacent to the pool complex in the rear garden of the property. The pool plant unit is to be located within the pool / spa complex building.

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

1.4 This report has been prepared by Acoustics Plus Limited (APL) with all reasonable skill, care, and diligence in accordance with generally accepted acoustic consultancy principles and taking account the services and terms agreed between APL and our client.

1.5 Any information provided by third-parties and referred to herein may not have been checked or verified by APL unless expressly stated otherwise. Certain statements made in the report are predictions based on reasonable assumptions and good industry practice.

1.6 Such statements involve risk and uncertainty which could cause measured and predicted results to differ materially. APL does therefore not guarantee or warrant any prediction contained in this report.

2. BASELINE SITUATION

2.1 The Application Site (the "site") is situated at Phyllis Court 22 Rosecroft Avenue, Hampstead, NW3. The site is a detached house on the eastern side of Rosecroft Avenue in Hampstead. The property comprises a single family house. It is intended to erect a pool and spa complex within an area of its garden.

2.2 As part of the development it is the intention to install a ASHP and pool heating unit system which will require the siting of an external unit in the rear garden behind the pool complex.

2.3 The ASHP unit associated with the development will be located within an open topped enclosure (this will screen the unit so there will be no line of site between it and the nearest receptor at 85a Redington Road (as highlighted). The proposed location of the unit can be seen in Diagram 1 below.

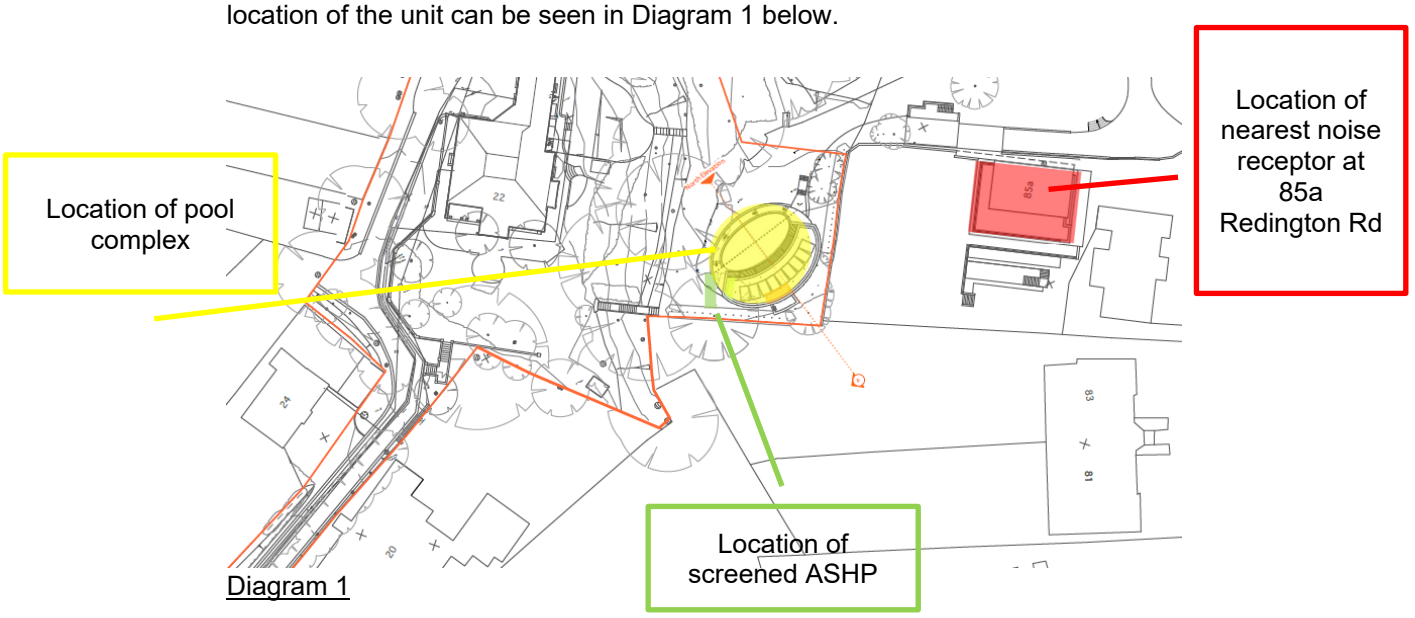


Diagram 1

2.4 The nearest noise sensitive façade to the ASHP enclosure / pool plant room belongs to the rear windows of the property located at 85a Redington Road (see Figures 1 & 5). The distance from the nearest noise sensitive façade to the location of the proposed ASHP unit was determined from scaled drawings and determined to be a minimum of 33m.

2.5 For the purposes of this report it has been assumed that the open topped enclosure will be formed of a close boarded timber screen (or equivalent) with a minimum mass of 15kg/m^2. The screen shall be tall enough to prevent line of sight with any windows belonging to 85A, 83 or 81 Redington Road.

3. NOISE OUTLINE

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

3.2 Measurements of background noise were obtained over a 24 hour period at a location deemed representative of background noise levels experienced at the nearest noise sensitive façade. The data obtained during the exercise was captured at ground floor level at the rear of the property, adjacent to the noise sensitive façade.

3.3 The particulars of the measurement exercise are recorded below. The weather conditions were considered appropriate to monitor environmental noise.

Date: 13th-14th August "020
Start Time: 11:17 hrs
Location: Rear garden 22 Rosecroft Avenue

3.4 Minimum background and average noise levels are shown in Table 1 below with the full 24 hour level vs time history shown in Diagram 2 (L_{Aeq} and L_{A90}).

Time period	Lowest $L_{A90,15min}$	Average $L_{Aeq,T}$
07:00-23:00hrs	35	52
23:00-07:00hrs	28	44

Table 1

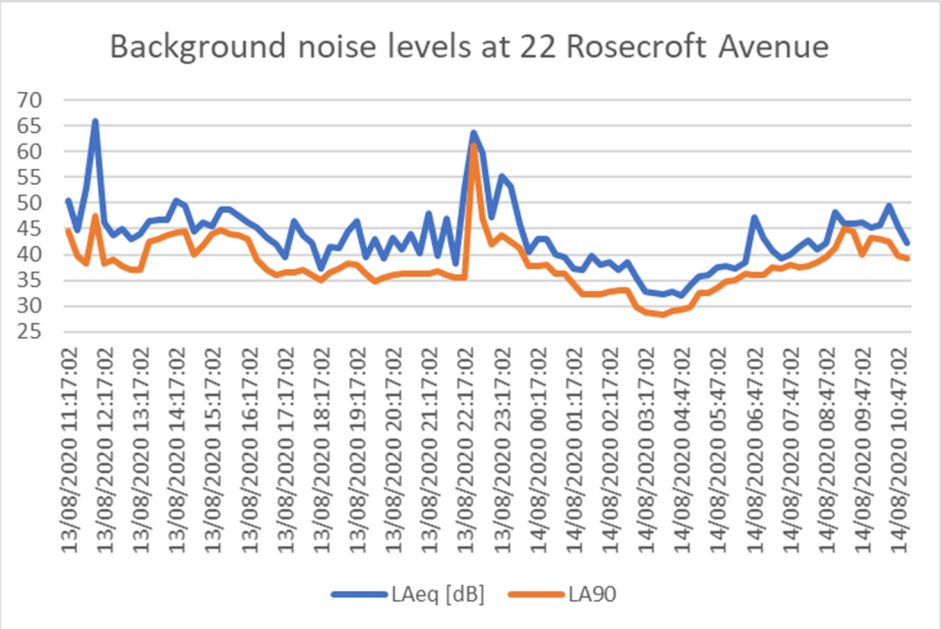


Diagram 2

4. DESIGN CRITERIA

4.1 Information regarding the noise levels not to be exceeded by the proposed installation was extracted from the LPA (London Borough of Camden) Local Plan Adopted version June 2017 (Appendix 3 Noise thresholds).

Industrial and Commercial Noise Sources

A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. 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 10 dB below background (15dB if tonal components are present) should be considered as the design criterion).

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 57dB L_{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 88dB L_{Amax}

*10dB should be increased to 15dB if the noise contains audible tonal elements. (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.

**levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.

The periods in Table C correspond to 0700 hours to 2300 hours for the day and 2300 hours to 0700 hours for the night. The Council will take into account the likely times of occupation for types of development and will be amended according to the times of operation of the establishment under consideration.

4.2 The procedure contained in BS4142 is to quantify the "specific sound level", which is the measured or predicted level of sound from the source in question over a one-hour period for the daytime and a 15 minute period for the night-time. Daytime is defined in the standard as 07:00 to 23:00 hours, and night-time as 23:00 to 07:00 hours.

4.3 The procedure contained in BS4142 is to quantify the "specific sound level", which is the measured or predicted level of sound from the source in question over a one hour period for the daytime and a 15 minute period for the night-time. Daytime is defined in the standard as 07:00 to 23:00 hours, and night-time as 23:00 to 07:00 hours.

4.4 The specific sound level is converted to a rating level by adding penalties to account for either tonality or impulsivity. The standard sets out objective methods for determining the presence of tones or impulsive elements, but notes that it is acceptable to subjectively determine these effects.

4.5 The penalty for tonal elements is between 0dB and 6dB, and the standard notes:

"Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible."

4.6 The penalty for impulsive elements is between 0dB and 9dB, and the standard notes:

"Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible."

4.7 The background sound level should be established in terms of the LA90 noise index. The standard states that the background sound level should be measured over a period of sufficient length to obtain a representative value. This should not normally be less than 15 minute intervals. The standard states that:

"A representative level ought to account for the range of background sound levels and ought not automatically to be assumed to be either the minimum or modal value."

4.8 And goes on to note:

"In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.

Among other considerations, diurnal patterns can have a major influence on background sound levels and, for example, the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night-time period for sleep purposes. Furthermore, in this general context it can also be necessary to separately assess weekends and weekday periods."

4.9 The assessment outcome results from a comparison of the rating level with the background sound level. The standard states:

a) Typically, the greater this difference, the greater the magnitude of the impact.
b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.
Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."

4.10 The standard also notes that:

"*Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night."*

4.11 In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014 edition places emphasis upon an appreciation of the context, as follows:

"An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context."

4.12 The background noise levels were assessed using statistical analysis of the measured data, as directed in BS4142. The histogram can be seen in Diagram 3. The quieter more noise sensitive night period has been considered.

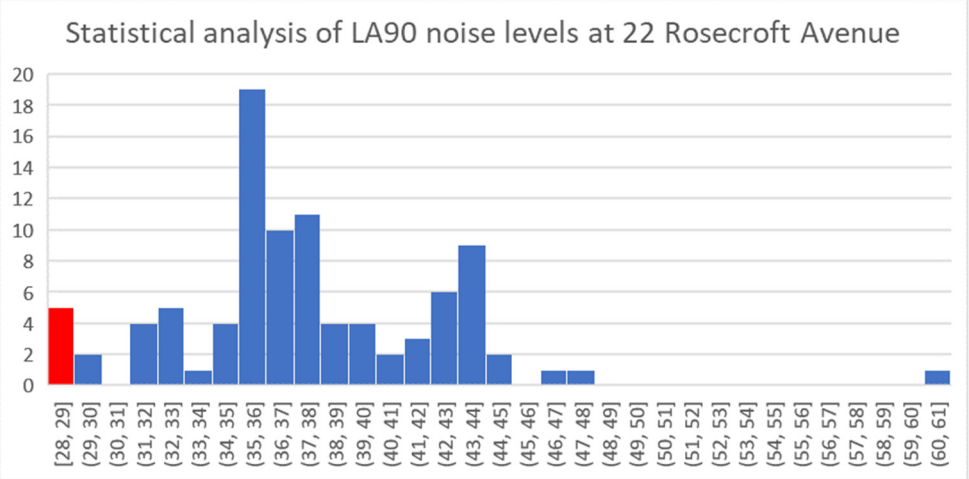


Diagram 3

4.13 The background noise levels vary significantly during the night period. The most commonly occurring background noise level during the night time period was 35dB $L_{A90,15min}$. Given the ASHP and pool plant unit could operate during the night period, in this instance it is considered that a representative background sound level of 28dB L_{A90} is deemed appropriate for the assessment.

4.14 The plant noise emission criteria that should not be exceeded is therefore based on Table 1 and is shown in Table 2 below. This level should not be exceeded at the nearest noise sensitive façade and is indicative of being 10dB less than the considered measured background noise. At such a level, there is an indication that the specific sound source will have a low impact.

Noise emission limit for mechanical plant
L_{Aeq} ≤18dB

Table 2

4.15 The ASHP unit that is proposed to be installed is yet to be specified but a typical unit is listed below (data sheet provided in Appendix A):

- 1 No. Daikin EMRQ14A @62dBA @1m

4.16 The pool house plant that will be located within the pool complex is understood to have a total reverberant level of 72dBA. The following noise data was received from Richard Harris, Guncast Pools and Wellness via email.

Plant description	Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
All plant (L_{pRev})	63	67	70	67	67	66	60	54	**72**

Table 3

5. EQUIPMENT

5.1 All background noise measurements were obtained using the following equipment:

- Svantek Svan971 Class 1 Serial No. 51704
- Rion Calibrator Type NC-74 Class 1 Serial No. 00410215

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

6. CALCULATIONS

6.1 A prediction exercise was undertaken. The calculation exercise utilised information provided by equipment manufacturers and distributors. As it is proposed to locate the external ASHP unit within an open topped enclosure, consideration was given to the attenuation provided by the screen.

6.2 Where applicable, a further correction to account for building edge diffraction of -10dB was assumed. This was extracted from the Department of Energy and Climate Change Planning Standard MCS020. This was due to the location of the unit behind the pool complex building with a proposed open topped enclosure around the unit.

6.3 The planning standard MCS020 states the following (Note 5):

"Note 5: Barriers between the heat pump and the assessment position (STEP 5)
A correction should be made for attenuation due to barriers between the air source heat pump and an assessment position. A correction will be necessary if an installer is unable to see an assessment position from the top edge of the air source heat pump. Use the following instructions to determine whether a correction is appropriate:

- *For a solid barrier (e.g. a brick wall or a fence) that completely obscures an installer's vision of an assessment position from the top edge of the air source heat pump attenuation of -10 dB may be assumed.*
- *Where a solid barrier completely obscures an installer's vision of an assessment position from the top or side edges of the air source heat pump, but moving a maximum distance of 25 cm in any direction to the air source heat pump allows an assessment position to be seen, attenuation of -5 dB may be assumed.*
- *If it is possible for an installer to see any part of an assessment position from the top or side edges of the air source heat pump no attenuation may be assumed. "*

6.1 In order to predict the noise impact of the operation of the ASHP, consideration has been given to noise egress to the nearest noise sensitive façade.

6.2 In considering the propagation of noise from the ASHP, consideration was given to point source propagation and attenuation provided by the acoustic screen.

6.3 Noise leaving the ASHP unit was propagated over 32m to the nearest noise sensitive façade.

6.4 The following corrections were accounted for to determine a rating level:

Results	Correction	Relevant clause	Commentary
On time correction	-3dB	7.3.14	The unit is likely to switch on and off as required on a demand for heating/cooling basis. The ASHP is assumed to be operating for half the 15min assessment period overnight
Acoustic feature corrections	+2dB +3dB	9.2 9.2	Just perceptible tonality Just perceptible impulsivity

Table 4

6.1 The calculation exercise for the ASHP is shown in Table 5.

Plant description	Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
EMRQ14A	66	64	63	59	57	53	46	44	62
Reflective plane correction	6	6	6	6	6	6	6	6	
Distance attenuation (32m)	-30	-30	-30	-30	-30	-30	-30	-30	
Building edge diffraction	-10	-10	-10	-10	-10	-10	-10	-10	
BS4142 correction	2	2	2	2	2	2	2	2	
Noise impact at facade	16	14	13	9	7	3	-4	-6	**12**

Table 5

6.2 In order to consider the noise egress from the pool plant contained within the pool house building, consideration was given to the sound reduction index of the building envelope.

6.3 A worst case scenario has been considered assessing the pool roof as being the weakest element in the pool complex plant space façade (no windows).

6.4 Based on the information supplied, it is anticipated the proposed roof construction will have a minimum nominal insulation value of around R_w 47dB. This performance value was obtained from proprietary prediction software 'Insul' written by Marshall Day. The predicted performance values were corrected to account for likely onsite performance. A copy of the prediction outputs for the construction considered is contained within Appendix B of this report.

6.5 The anticipated sound reduction index afforded by the roof construction is as follows, calculated using INSUL (Table 6 below), the predicted insulation values were corrected to account for installation onsite (-7dB).

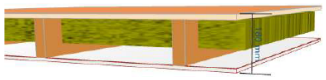
Pool house	**R Octave Band Centre Frequency (Hz)**								**R_w**
	63	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	
Zinc roof	5	15	31	38	43	45	46	46	**47**

Table 6

Sound Insulation Prediction (v9.0.8)

Program copyright Marshall Day Acoustics 2017
margin of error is generally within Rw +/- 3 dB
- Key No. 2501
Job Name:
Job No.: Initials:Andre
Date:28/09/2020
File Name:Ins... Notes:

INSUL



Rw 47 dB
C -4 dB
Ctr -11 dB

Mass-air-mass resonant frequency = =56 Hz
Panel Size = 2.7 m x 4.0 m
Partition surface mass = 28.4 kg/m²

System description

Panel 1 : 1 x 1 mm Copper + 1 x 17.5 mm Plywood

Frame: Solid Joist; Cavity Width 150 mm ,Stud spacing 600 mm , 1 x Fibreglass (10kg/m3) Thickness 100 mm
Panel 2 + 1 x 12 mm Gyproc Moisture Resistant 12mm

6.6 In considering the propagation of noise from the pool house plant room located within the complex, consideration was given to the following formula:

$$L_{p_2} = L_{p_1} - R - 6$$

Where L_{p_2} *is the sound pressure level close to the complex on the outside*
L_{p_1} *is the reverberant sound pressure level in the plant room*
R is the sound reduction index of the pool house roof.

6.7 The following corrections were accounted for to determine a rating level:

Results	Correction	Relevant clause	Commentary
On time correction	+0dB	7.3.14	The pool unit is likely to operate continually
Acoustic feature corrections	+2dB +0dB	9.2 9.2	Just perceptible tonality No perceptible impulsivity

Table 7

6.8 Noise leaving the pool house was propagated over 25m to the rear windows of 85a Redington Road.

Pool house	Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
All pool plant (L_{pRev})	63	67	70	67	67	66	60	54	72
R – pool roof	5	15	31	38	43	45	46	46	
Distance attenuation (25m)	-28	-28	-28	-28	-28	-28	-28	-28	
Building edge diffraction	0	0	0	0	0	0	0	0	
BS4142 correction	2	2	2	2	2	2	2	2	
Façade level	26	20	7	-3	-8	-11	-18	-24	**7**

Table 8

6.9 The combined impact of the ASHP and pool house plant room are considered in Table 9 below.

Total noise impact	Octave Band Centre Frequency (Hz)								dBA
	63	125	250	500	1k	2k	4k	8k	
ASHP (Table 5)	16	14	13	9	7	3	-4	-6	12
Pool plant room (Table 8)	26	20	7	-3	-8	-11	-18	-24	7
Façade level	26	21	14	9	7	3	-4	-6	**13**

Table 9

6.10 In order to comply with the requirements of the LPA, any noise from the proposed installation of mechanical plant should not exceed a level of 18 dBA at 1m from the nearest noise sensitive façade.

6.11 The calculated noise impact is 13dBA. The calculation exercise (Table 9) demonstrates that the proposed installation meets the LPA criteria.

7. CONCLUSION & MITIGATION MEASURES

7.1 The foregoing mechanical plant assessment indicates that the proposed installation will meet the requirements imposed by the LPA. Further mitigation measures, other than those identified, will not be required. The mitigation measures that must be implemented are as follows:

- *Acoustic screen around the proposed ASHP*
- *Building edge diffraction is to be provided by screening any line of sight between the ASHP and the neighbouring residential windows belonging to 85A, 83 or 81 Redington Road.*
- *The pool house plant is to be contained within the pool / spa complex.*

7.2 If an alternative supplier or manufacturer of ASHP or pool plant is chosen, the acoustic performance should be checked prior to installation to ensure that the installation will still meet the requirements imposed by the LPA.

7.3 It is also recommended that the units are positioned on vibration isolation mounts to minimise structural borne vibration and re-radiated noise into the building. Rubber turret mounts are suitable for this kind of application, available from the following, as shown in Diagram 4 below.

	Christie & Grey Limited Morley Road, Tonbridge, Kent, TN9 1RA, United Kingdom T: +44 (0)1732 371100 F: +44 (0)1732 359666 E: sales@christiegrey.com OR Mason UK Ltd Unit 6 Abbey Business Park Monks Walk Farnham Surrey GU9 8HT Tel: (01252) 716610 Fax: (01252) 716630 info@masonuk.co.uk

Diagram 4

Figures

Phyllis Court, 22 Rosecroft Avenue, London, NW3

87 Redington Road

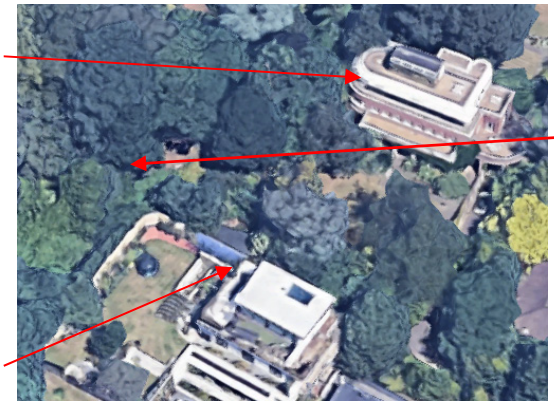


Figure 1

Figure 2

Measurement location

Nearest considered noise sensitive façade - rear of 85A Redington Road

Figure 3

Figure 4

Location of pool / spa complex

85A Redington Road

Figure 5

Figure 6

Appendix A

Andy Dodd

From: Nick Herridge <nherridge@dftpm.co.uk>
Sent: 26 August 2020 08:40
To: Andy Dodd
Subject: Fwd: New pond and pool.

Hi Andy.

Please see below for motor details from the pool company. We will not be using a gas boiler

Regards

Nick Herridge

DFT Property Management Ltd

M: 07979 853452

Begin forwarded message:

> **From:** Richard Harris <richard@guncast.com>
> **Date:** 3 August 2020 at 15:09:24 BST
> **To:** Nick Herridge <nherridge@dftpm.co.uk>
> **Subject: Re: New pond and pool.**
>
> Good afternoon Nick.
>
> Further to our discussion last week, please find below a list of equipment used on an outdoor pool.

Plant Description	Qty.	Plant Make	Model Number	Power (kW)
Circulation Pump	1	Pentair	Sta-Rite 5p2r	1.1
Automatic Pool Cleaner	1	Zodiac	Polaris 380 booster pump	0.56
Boiler	1	Pentair	Master Temp 250 BTU/Hr	0.07
Ozone Disinfection	1	Grundfos	CH, CHN	0.56
Counter Swimjet	1	TBC	TBC	TBC

> This has previously been prepared for a similar project where a noise reading was taken and the results were :

Plant Description	Data Type	Sound Pressure Level at Octave Band Centre Frequency (Hz)								dBA
		63	125	250	500	1k	2k	4k	8k	
All Plant	L_{pRev}	63	67	70	67	67	66	60	54	72

Heatstar Energy Technology Systems

ADVANCED SWIMMING POOL CLIMATE CONTROL SYSTEMS

PROJECT ANALYSIS SUMMARY

Aerothermal swimming pool heat pump

Contact name :	**Nick Herridge**	T **07979853452**	E **nherridge@dftpm.co.uk**
Company :	**DFT Property Management Ltd**		**20/08/2020**
Project Title / Ref :	**Phyllis Court**		D10039C

Project Design Criteria :

Pool Type :	Outdoor	
Pool location :	0	
Swimming season :	Jan to Dec	
Ground Water :	Not in contact with pool	
Pool surface area :	48	m^2
Av. Pool water temp. :	28	°C
Hours pool uncovered :	6	hrs/Day

Probable Seasonal Pool heating Cost :

Method:		Cost	Energy kWh
Aquarius :	£	4,847	33,662
Mains Gas boiler :	£	4,431	105,495
Oil boiler :	£	5,900	105,495
LPG boiler :	£	6,407	105,495
Electric heating :	£	13,672	94,945
Electric heating E7 :	£	10,349	94,945

FREE RENEWABLE ENERGY UTILISED BY AQUARIUS HEAT PUMP : 64,005

Model : Aquarius 6 Winter De-Frost PLUS

integral 9kW Booster

Specification details :

Heat Output to Pool :	40.2	kW @ 20°C Air
Sound pressure :	58	db(A) at 3m
Pool water flow :	110-215	L/Min.
Electrical : 1 phase	59	Amps
50Hz 3 phase	21	Amps / Phase

Pipe connections :

Pool water :		1.5	inch
Condensate Drain :		22	mm PVC
Dimensions :	H :	1210	mm
	L :	1540	mm
	D :	855	mm
	Net Weight :	296	Kg

TRADE PRICE :	£	9,810	Soft Start Option :	£ **627**
Net Carriage charge:	(UK Mainland Only)			£ **152**

Availability : Normally 4-5 weeks from confirmation of order

Payment terms : 10% deposit with order. Balance by cheque 7 days before delivery, or bank draft on delivery

All prices include discount, are net ex works, and are subject to VAT at applicable rates.
This quotation is subject to the terms & conditions of sale of HS Europe Ltd & is valid for 90 days.
Probable heating cost data is indication only not intended to be binding. E&OE

Key features check list :

- Exceptional Warranty : 20 Years on Water Heat Exchanger, 5 years on compressor.
- Anodised aluminium unit chassis with 20 year warranty.
- Titanium Pool Water Heat Exchanger for maximum anti-corrosion protection.
- Highest possible coefficient of performance.
- Ultra low noise direct-drive air fan - unit suitable for installation inside or outside.
- Digital electronic variable anti-ice regulation control for air heat exchange coil.
- Digital electronic automatic pool water temperature control with status indicators.
- Anti-corrosion Epoxy coated air heat exchange coil, guarded by fresh air filter.
- On-site service support by Heatstar Technicians and extendable warranty available.

Prepared for you by : DANNY RACKETT
danny@heatstar.com Tel : 01983 521465

Heatstar Energy Technology Systems

Installation Services

Heatstar Project Ref:	D10039C	20-Aug-2020
Project Title:	**Phyllis Court**	

System specified : AQUARIUS 6 Winter De-Frost PLUS

integral 9kW Booster

Electricity:

Supply type :	3 phase not normally available for this model. 1 ph-Neutral-Earth 230v 50Hz Protected supply.	or
Supply rating :	Three Phase: 21 Amps Single Phase: 59 Amps	or
Nom. Running current :	Three Phase: 21 Amps Single Phase: 59 Amps	or
Protection required :	RCD (30mA) / Short circuit (MCB)	
Other wiring available :	Water pump interlock	

Condensate Water Drain:

Pipe connection :	22	mm PVC / compression
Trapping required :	100	mm Minimum height 'P' trap.

Pool Water Supply:

Connection size / type:	1.5	Inch PVC / Couplers on balanced by-pass.		
Flow rate required :	110-215 L/Min.		@ 0.9-1.5	m hd internal

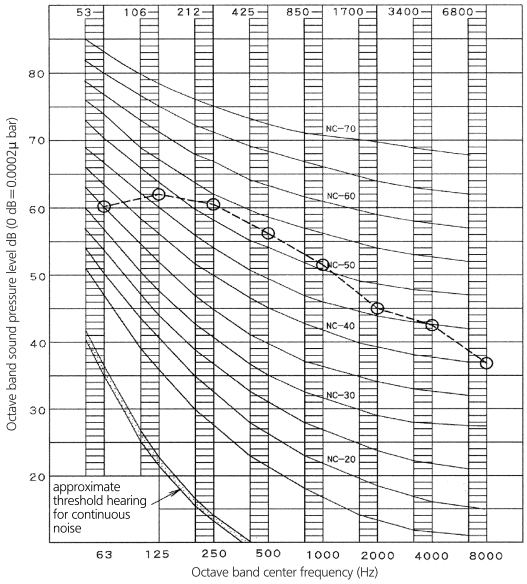
Refrigerant Data : 2 x 2.1 kG of R407C : Hermetically sealed.

E&OE

10 Sound data

10 - 2 Sound Pressure Spectrum

EMRQ8A



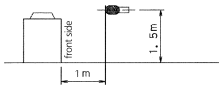
NOTES

1 Overall (dB)

Scale	50 Hz
A	58
C	66

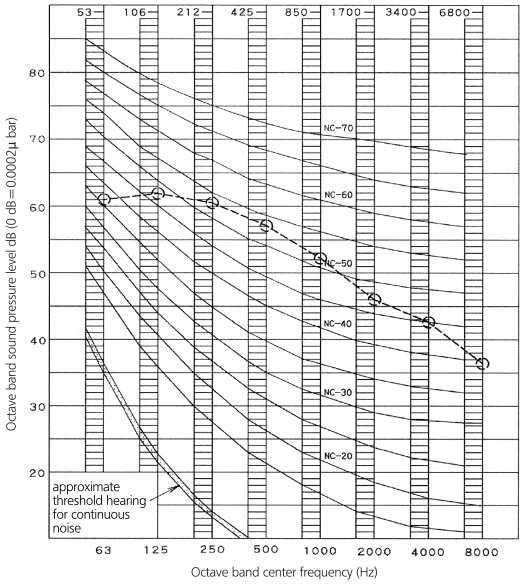
(B,G,N is already rectified)

2 Measuring place: Anechoic chamber (conversion value)
3 Operating conditions: Power source: Y1 : 380-415V 50Hz
4 The operating sound is measured in anechoic chamber, if it is measured under the actual installation conditions, it is normally over the set value due to enviromental noise and sound reflection.
5 Location of microphone



3TW59927-1A

EMRQ10A



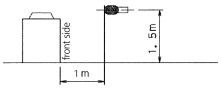
NOTES

1 Overall (dB)

Scale	50 Hz
A	58
C	66

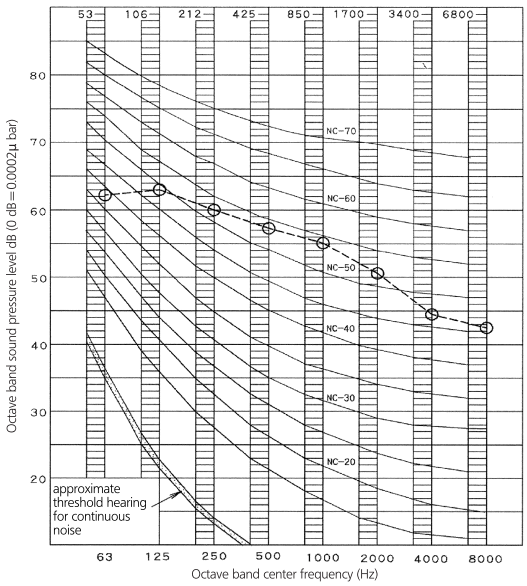
(B,G,N is already rectified)

2 Measuring place: Anechoic chamber (conversion value)
3 Operating conditions: Power source: Y1 : 380-415V 50Hz
4 The operating sound is measured in anechoic chamber, if it is measured under the actual installation conditions, it is normally over the set value due to enviromental noise and sound reflection.
5 Location of microphone



3TW59927-1A

EMRQ12A



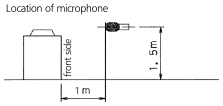
NOTES

1 Overall (dB)

Scale	50 Hz
A	60
C	67

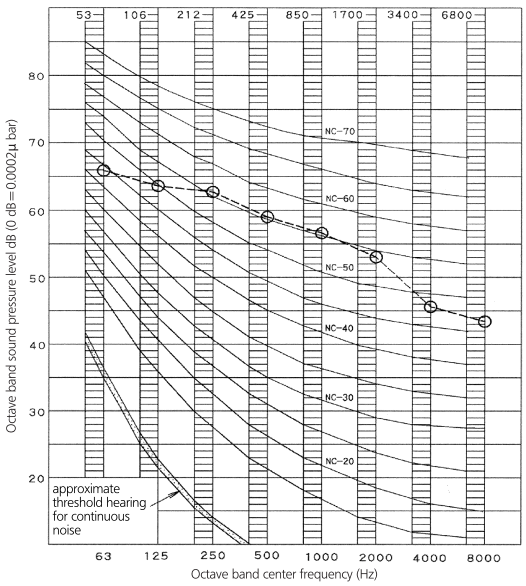
(B,G,N is already rectified)

2 Measuring place: Anechoic chamber (conversion value)
3 Operating conditions: Power source: Y1 : 380-415V 50Hz
4 The operating sound is measured in anechoic chamber, if it is measured under the actual installation conditions, it is normally over the set value due to enviromental noise and sound reflection.
5 Location of microphone



3TW59927-1A

EMRQ14A



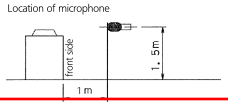
NOTES

1 Overall (dB)

Scale	50 Hz
A	62
C	69

(B,G,N is already rectified)

2 Measuring place: Anechoic chamber (conversion value)
3 Operating conditions: Power source: Y1 : 380-415V 50Hz
4 The operating sound is measured in anechoic chamber, if it is measured under the actual installation conditions, it is normally over the set value due to enviromental noise and sound reflection.
5 Location of microphone



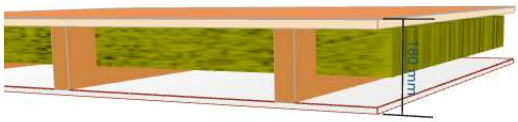
3TW59927-1A

Appendix B

Sound Insulation Prediction (v9.0.8)

Program copyright Marshall Day Acoustics 2017
margin of error is generally within Rw +/- 3 dB
- Key No. 2501
Job Name:
Job No.: Initials:Andre
Date.:28/09/2020
File Name:Insu'

Notes:



Rw	47 dB
C	-4 dB
Ctr	-11 dB

Mass-air-mass resonant frequency = =56 Hz
Panel Size = 2.7 m x 4.0 m
Partition surface mass = 28.4 kg/m²

System description

Panel 1 : 1 x 1 mm Copper + 1 x 17.5 mm Plywood

Frame: Solid Joist: Cavity Width 150 mm ,Stud spacing 600 mm , 1 x Fibreglass (10kg/m3) Thickness 100 mm
Panel 2 + 1 x 12 mm Gyproc Moisture Resistant 12mm

Floor Cover: Thickness 0.02 mm

freq.(Hz)	TL(dB)	TL(dB)
50	17	
63	11	12
80	11	
100	18	
125	25	22
160	31	
200	35	
250	38	38
315	41	
400	43	
500	45	45
630	47	
800	49	
1000	50	50
1250	51	
1600	50	
2000	51	52
2500	57	
3150	55	
4000	51	53
5000	55