Car Lift Noise Assessment

Report No – **9384A-2**
Client – **Linden Homes**
Site – **Gondar Gardens, Former Reservoir, London NW6**

noise.co.uk

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2.0 Object

The development is known as Gondor Gardens, West Hampstead, London NW6.

The object of this report is to present the findings of a desktop study which has been commissioned by the Client to assess the acoustic impact of an hydraulic car Lift system which is housed in a purpose built plant room on the basement level of the development.

It is understood that there is a planning requirement set down by the Local Authority which requires and noise from mechanical and electrical services plant to be 10dB below the minimum prevailing background levels at the nearest residential receiver. In this case use is made of an earlier background noise report produced by noise.co.uk Ltd on 9th - 16th November 2010 which details the findings of a 24 hour background noise assessment on site. [Report No9587-1].

The report is designed to provide the objective evidence to prove compliance with the Local Authority planning requirement.

3.0 Scope

The scope of this report is as follows:

1) Presentation of sound pressure level prediction findings

2) Presentation of acoustic findings and comparison with current planning requirements of the Local Authority. See below (confirmed in client email see below)

It s understood the E ternal No se Level fro the l ft u would need to e 10d A lower than the n u reva l n ack round no se level.

It is understood that the car lift may be operational at anytime during the 24 hour period 7 days per week.

4.0 Sound Pressure Level Prediction

Lift Plant Room:

The lift pump room location is detailed below:

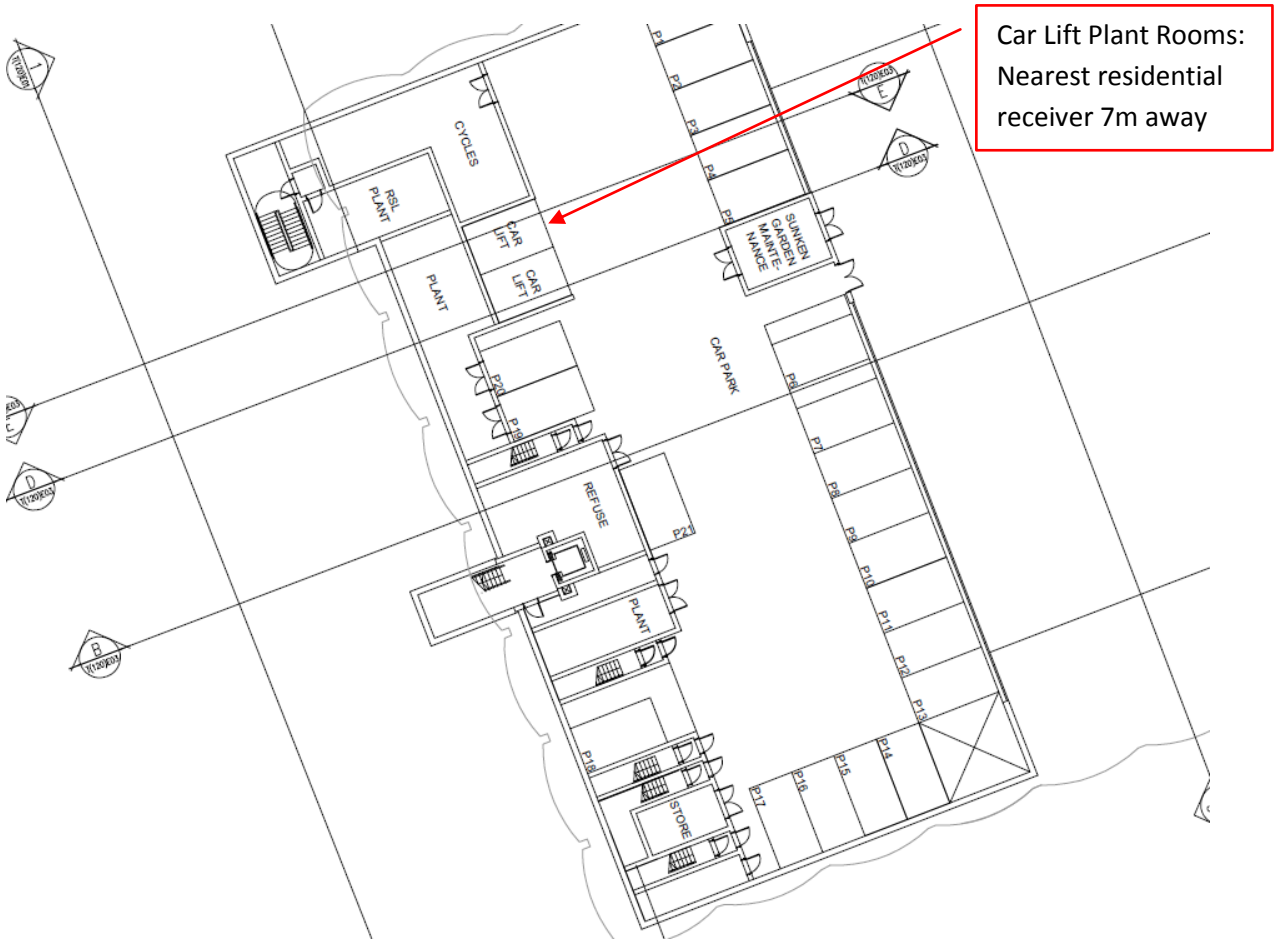


Figure 1: Car Lift Plant room approximate dimensions 5m x 4m x 2.4m high

Car Lift Plant Room:

The external wall is a cavity wall construction assumed to be a min 380Kg/m2 mass with double hardwood reinforced door access to the space.

The Lift hydraulic pump system is understood to be housed entirely within the plant room. The manufacturers data indicates that it will produce a worst case sound pressure level of 70dB(A) @ 1m maximum from each unit: see below:

Lift Motor Room

Lift Operation noise level would not normally exceed 70 dB(A) when measured at 1.5 metres from the face of the oil tank and 1.0 metres above the level of the motor room floor. Measures should be taken by others in the design & construction of the lift motor room to contain this level of noise.

Figure 2: Lift Manufacturers Technical Specification - Full Sheet Detailed in the Appendix.

NOTE: This sound pressure level is for 1 off car lift system there are two programmed for installation on this site. If all operate at full duty the resulting sound pressure level would be:

2 x 70dB(A) = 73dB(A)

It is understood from the client that the nearest residential receiver is approximately 7m from the plant room facade.

In order to predict the sound pressure level at the nearest sensitive receiver the following assumptions are made.

1) Hydraulic pump noise (Octave bands) is taken from standard acoustic Text Engineering Noise Control 2nd Edition - Bies & Hansen.

2) Wall to door surface area is approximately 4:1 ratio.

3) the minimum prevailing background noise level can be taken from the survey carried out by noise.co.uk (and detailed in the Appendix to this document) the minimum recorded LA90 over the noise monitoring period was 33dB LA90,5min.

3) Cavity masonry wall performance is taken from Appendix 13B sound reduction index table[1]: see below:

4) Door sound reduction index is also taken from Appendix 13B (worst case assumed wooden solid doors)see below

	63	125	250	500	1k	2k	4k
Assume min mass 380Kg/m2: Appendix 13B SRL NCinBS. P403	28	34	34	40	56	73	76
Solid Hardwood Door (worst case SRI): Appendix 13B SRL NCinBS. P403	13	17.0	21.0	26.0	29.0	31.0	34.0

Predicted sound pressure level:

The predicted sound pressure level is detailed in Table 1 in the Appendix and is summarised below:

	63	125	250	500	1k	2k	4k	dB(A)
Sound Pressure Level Outside Residential Property Boundary	26	25	23	17	19	5	-2	**22**
Minimum Night Time Background Sound Pressure Level (LA90,5min): noise.co.uk Ltd noise report No9587-1								**33**
Excess of Lift Pump Noise over background (Worst Case Condition) dB(A)								**-11**
Conclusion : Complies with Planning Requirement. Condition satisfied								

Predicted Sound Pressure Level from Lift pump Room Breakout at facade of nearest residential receiver = 22dB (A)

As the prevailing minimum background sound pressure level recorded over the period 9th - 16th November 2010 was 33dB LA90,5min the lift hydraulic pump noise is 10dB below the minimum background sound pressure level on site.

5.0 Conclusion

The lift pump noise has been assessed using manufacturer's data and standard prediction methods for calculating noise breakout from a plant room.

The plant room location is taken from the drawings. The nearest receiver is on the proposed development at approximately 7m distance. The plant room design is taken from standard construction and access to it from external areas is through standard double solid wooden doors.

The predictions indicate that the lift pump noise will be 11dB below the minimum background sound pressure level at the nearest residential receiver during the quietest period of the night (weekend period) if both car lifts are working simultaneously.

Based on this prediction the Local Authority planning requirement is met.

W.A.Whitfield BA. MSc, MIOA

Noise & Vibration Consultant

[1] No se Control n u ld n Serv ces SRL Ltd - Per a on Press

Appendix

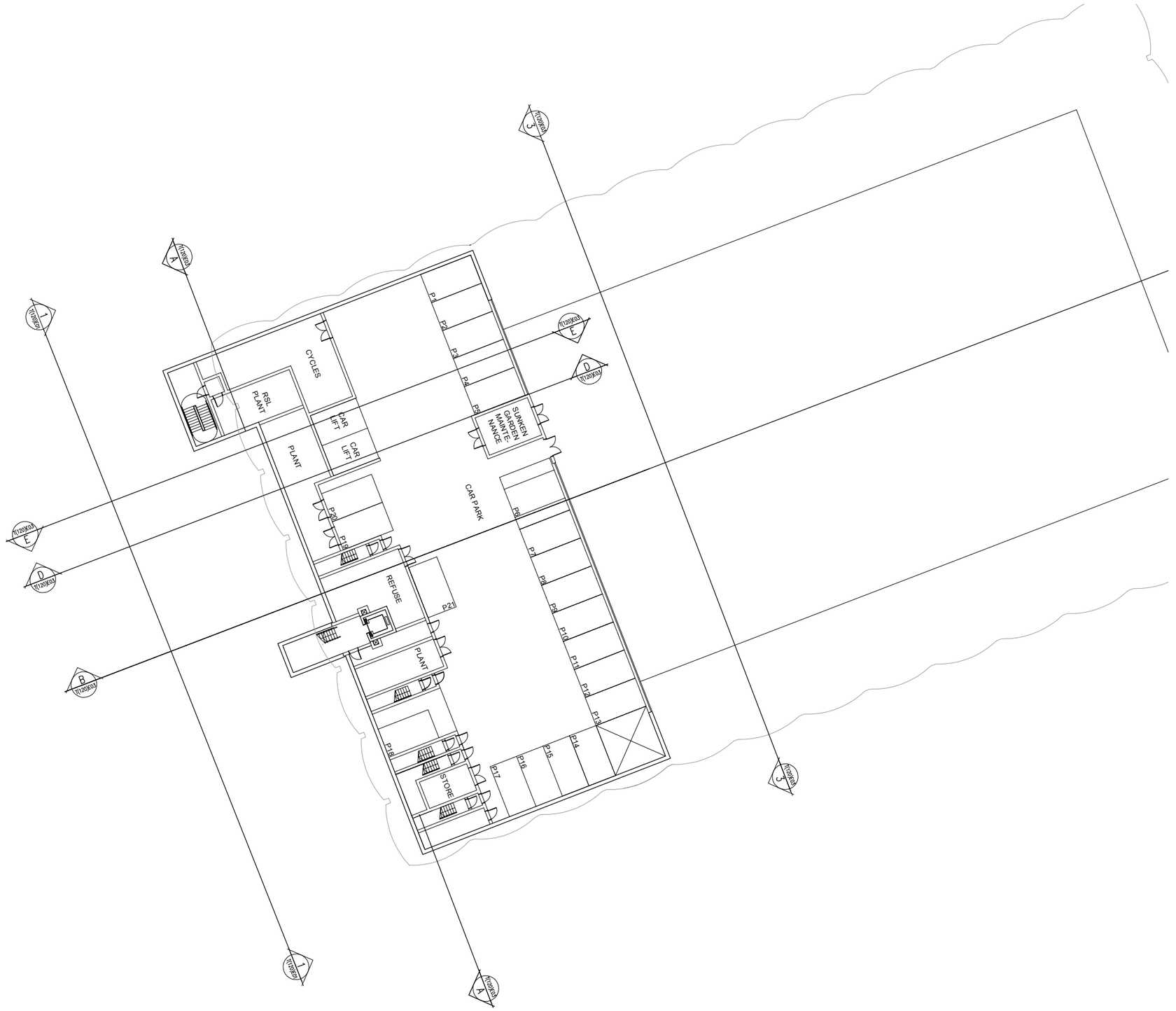
NOTES

1 The Contractor must check and confirm dimensions

2 All discrepancies must be reported and resolved by the Architect before works commence

3 This drawing is not to be scaled

4 All work and materials to be in accordance with current applicable Statutory Legislation and to comply with all relevant Codes of Practice and British Standards.



1 BASEMENT LEVEL PLAN
SCALE: 1: 200 (A1)

Rev	Date
D Revised Plans	16/01/12
C Drawing Number changed for Planning	11/01/12
B Issued for Information	10/01/12
A Drawings developed	14/12/11

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Client
LINDEN WATES (WEST HAMPSTEAD) LTD.

Project
GONDAR GARDENS

Drawing
PLAN
BASEMENT LEVEL

Scale	Date	Drawn
1: 200 (A1)	NOV 2011	RS

Drawing No	Revision
4870 / T1(20) P-2	D

CAD Ref No
G:\4870\T_Series\T20\2nd Application\T120P-2

This scale is 100mm in length when printed at the size indicated in the title block.

Typical Noise Levels

The following are typical figures taken on a similar mast type hydraulic installation.

Typical in car figures.

Door operation noise level would not normally exceed 75 dB (A) when measured at 1.5 metres above floor and 1.0 metres from the inner door face.

Lift operation noise level during any part of the lift cycle and with an occupancy level between zero and contract load would not normally exceed 55 dB (A) when measured at 1.5 metres above floor level and 1.0 metres from the inner door face.

Lift Lobbies

Door operation noise would not normally exceed 75dB (A) when measured at 1.5 metres from the floor and 1.0 metres from the door outer face.

Lift operation noise during any part of the lift cycle and with any occupancy level between zero and contract load would not normally exceed 60dB (A) when measured at 1.5 metres above floor and 1.0 metres from the outer door face.

Lift Motor Room

Lift Operation noise level would not normally exceed 70 dB(A) when measured at 1.5 metres from the face of the oil tank and 1.0 metres above the level of the motor room floor. Measures should be taken by others in the design & construction of the lift motor room to contain this level of noise.

Table 1: Calculation of Composite Sound Reduction Index - Common Room Façade - Nearest Residential Receiver

Includes Wall and Dou le Access Doors to ase ent Level Plant Roo

	63	125	250	500	1k	2k	4k	76
Internal Sound Pressure in Common Room Using Typical Lift Motor Noise Spectrum Table 11.6 Bies & Hansen p444	12	11	9	9	6	9	13	**dB(A)**
L 70d A fro L ft Manufacturers No se Data Sheet 2 off 73d A	64	65	67	67	70	67	63	**73**

Nearest Res dent al Pro erty 7 away Ground Floor

A ro Surface Area of Wall	4 2.4	9.6
A ro Surface Area of Door	2 2.1	4.2
A ro Wall to Door Rat o	4 1	

Compute the Contribution from Boiler Room

			63	125	250	500	1k	2k	4k
Wall Construct on - Dou le Sk n asonry Wall	Assu e n ass 380K 2 A end 13 SRL NC n S. P403		28	34	34	40	56	73	76
Door Construct on - door set.	Sol d ardwood Door worst case SRI A end 13 SRL NC n S. P403		13	17.0	21.0	26.0	29.0	31.0	34.0
D fference n uld n ele ents			-15	-17	-13	-14	-27	-42	-42
			7	11.0	7.0	7.0	22.0	28.0	28.0

Co os te Sound Reduct on Inde F 5.9 SRL No se Control n uld n Serv ces assu ed rat o 1 3

Co os t e Wall Roof SRI Non -un for art t ons

	63	125	250	500	1k	2k	4k
F nal Co os te SRI Pu Roo	**21**	**23**	**27**	**33**	**34**	**45**	**48**

Noise Breakout to Residential Property Calculated Using L2 = L1 - R + 10Log S - 20 Log r - 14 (Where S = Area of Common Room Wall & r is distance to Residential Property 17m)

			63	125	250	500	1k	2k	4k	
Sound Pressure Level n Pu Roo			64	65	67	67	70	67	63	
Co os te Sound Reduct on of Co on Roo Fa ade			21	23	27	33	34	45	48	
10Lo S	s Door front fa ade	13.8	11	11	11	11	11	11	11	
20 Lo r	r 7	7	17	17	17	17	17	17	17	
Fa ade Correct on	3d	3	3	3	3	3	3	3	3	

	63	125	250	500	1k	2k	4k	d A
Sound Pressure Level Outside Residential Property Boundary	26	25	23	17	19	5	-2	**22**

Minimum Night Time Background Sound Pressure Level (LA90,5min): noise.co.uk Ltd noise report No9587-1 **33**

Excess of Lift Pump Noise over background (Worst Case Condition) dB(A) **-11**

Conclusion : Complies with Planning Requirement. Condition satisfied