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24-HOUR NOISE LEVEL SURVEY CARRIED OUT IN THE REAR GARDEN OF 48 QUEENS GROVE, LONDON NW8 AND A REPORT ON THE NOISE CONTROL MEASURES REQUIRED TO MINIMISE THE NOISE IMPACT OF THE PROPOSED NEW EXTERNAL PLANT

Test Engineer : J R Tait

Report Author : J R Tait

Authorised for Release by : M G Roberts

Client	:	Capital Residential Management Ltd
Project	:	48 Queens Grove, London NW8
Emtec Ref.	:	QF6142/PF4447/RP2
Issue Date	:	30th September 2011

QF6142/PF4447

EMTEC PRODUCTS LTD

24-HOUR NOISE LEVEL SURVEY CARRIED OUT IN THE REAR GARDEN OF 48 QUEENS GROVE, LONDON NW8 AND A REPORT ON THE NOISE CONTROL MEASURES REQUIRED TO MINIMISE THE NOISE IMPACT OF THE PROPOSED NEW EXTERNAL PLANT

1.0. INTRODUCTION

This report details the results of a 24-hour noise survey carried out in the rear garden of 48 Queens Grove, London NW8.

The objectives of this survey were as follows:

- To establish the existing background noise level in the vicinity of the nearby residential premises.

- To assess the proposed new plant that is to be located within two light wells at the rear of the development and to recommend a noise limit and measures to ensure that the operation of the new plant does not disturb the occupants of the neighbouring residential and commercial properties.

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

2.0. TEST INSTRUMENTATION

All measurement equipment used during the survey complied with the requirements of BS4142:1997 "Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas". Details of the equipment are as follows:

Integrating Sound Level Meters	: Bruel & Kjaer type 2231 fitted with a Bruel & Kjaer type 4155 ½ inch condenser microphone.
Statistical Analysis Modules	: Bruel & Kjaer type BZ 7115 capable of computing the percentile levels L1, L10, L50, L90 and L99 and also the Leq level.
Acoustic Calibrator	: Bruel & Kjaer type 4231 electronic calibrator.

Calibration was performed before and after the surveys and found to be, in all cases, +/- 0.1 dB from the reference source.

3.0. TEST PROCEDURE

The survey was conducted during a continuous 24-hour period from 08.18am on Thursday the 22nd of September 2011 to 08.18am on Friday the 23rd of September 2011.

Data was continuously acquired throughout the measurement period with the individual averaging time for statistical noise data set to 20 minutes. The following statistical measurements were recorded concurrently:

LA1 - The Sound Pressure Level exceeded for 1% of the measurement period.

LA10 - The Sound Pressure Level exceeded for 10% of the measurement period.

LA50 - The Sound Pressure Level exceeded for 50% of the measurement period.

LA90 - The Sound Pressure Level exceeded for 90% of the measurement period. LA90 is considered to represent the "background noise level" during the measurement period and is used for the assessment of noise to determine the likelihood of complaints (See BS 4142).

LA99 - The Sound Pressure Level exceeded for 99% of the measurement period.

LAeq - The continuous steady state Sound Pressure Level that has the same acoustic energy as the real fluctuating level.

All noise levels recorded were filtered using a standard 'A' Weighting filter.

3.1. Measurement Positions

The noise levels were measured in the garden at the rear of the house approximately 5 metres from the nearest residential accommodation that might be affected by the proposed plant.

The microphone was positioned so that it was pointing out over the garden, directly towards the nearest affected residential windows.

The microphone was approximately 1.2 metres above the ground level. The rest of the measurement equipment was located in a weatherproof enclosure with a low impedance cable running from the microphone to the instrumentation.

3.2. Weather Conditions

The weather conditions prevailing during the measurement period were generally in line with those recommended in BS 4142:1997. The weather was clear and bright throughout the daytime periods and clear to overcast during the nightime period. Wind was light to still throughout the test period.

The microphone was protected throughout the tests by an acoustically transparent wind balloon.

4.0. RESULTS

The raw test data, gathered during the 24-hour noise survey, is given in Appendix 'A 'of this report.

The 'A' Weighted Leq levels measured over each 20 minute interval throughout the 24-hour periods (denoted by LAeq, (20 mins) are displayed as a bar graph on the attached Sketch No QF/6142/T3 at the back of this report.

The 'A' Weighted percentile levels measured over each 20 minute interval denoted by LA10 (20 mins), LA50 (20 mins) and LA90 (20 mins) are displayed as a line graph on the attached Sketch No QF/6142/T4at the back of this report.

4.1. Summary of Results

The table QF/6142/D1 below summarises the noise levels taken over the 24-hour period in terms of the maximum and minimum Sound Pressure Levels recorded.

Table QF/6142/D1 – Summary of Maximum and Minimum Noise Levels

	LA1	**LA10**	**LA50**	**LA90**	**LA99**	**LAeq**
Min.	41.5dBA	35.5dBA	32.0dBA	30.5dBA	29.5dBA	34.0dBA
Max.	68.5dBA	57.5dBA	48.0dBA	45.0dBA	42.5dBA	57.7dBA

5.0. DISCUSSION OF RESULTS

Residential design criteria

To comply with Camden's current Unitary Development Plan, noise from the external plant must be at least 5dB less than the lowest measured LA90 when measured at 1 metre external to the nearest sensitive façade. (Assuming inverter controlled condensers emitting noise that does not contain a distinguishable discrete continuous note / whine / hiss /screech / hum).

The lowest recorded LA_{90} level measured during the 24-hour period was 30.5dBA, which occurred twice. Once during the time period ending at 02.58am and again during the time period ending at 3.38am.

All proposed plant that is to operate on a 24-hour basis should be designed to achieve a noise level 10dB below the lowest LA_{90} level, ie: 25.5dBA, at 1 metre from the nearest residential property's window.

Design noise limits

Based upon the above we summarise the actual design rating levels to be adopted for this project in table QF/6142/D2 below: -

Table QF/6142/D2 – recommended design rating levels $L_{Ar,T}$

Type of premises	**$L_{Ar,T}$ (24-hour)**	**$L_{Ar,T}$ (07.00am – 23.00pm)**
Residential	25.5dBA	32.5dBA

Measures to mitigate noise

The proposed external plant comprises 4 No. air cooled condensers. These are to be located at the bottom of two separate light-wells.

Light well 'A' is the larger of the two light-wells and is positioned near to the rear garden. This will contain a Daikin RXYSQ6P condenser and a Daikin type RXYSQ4P condenser.

Light well 'B' is the smaller of the two light-wells and is positioned nearer to the garden at the side of the house. This will also contain a Daikin RXYSQ6P condenser and a Daikin type RXYSQ4P condenser.

The location of the light wells relative to the property and the nearest affected residential property, 30 St. John's Wood Park, is shown on the attached plans at the rear of this report.

We shall discuss the effect of the externally located condensers in each light well in turn:

Lightwell 'A'

Without any attenuation, and allowing for a reflective environment within the light-well surrounding the condensers, we calculate the noise level outside the nearest affected window at the rear of 30 St. John's Wood Park, with all the equipment in operation, to be in the order of 37dBA.

37dBA is 12.5dB above the design target of 25.5dBA, which means the noise generated by the condensers will need to be attenuated in order to meet the planning requirement.

A carefully designed acoustic louvred enclosure around the condensers could achieve the necessary attenuation, providing it has minimum overall insertion losses as follows: -

Enclosure insertion loss at octave band centre frequencies							
63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
5	7	9	12	18	19	15	15

Lightwell 'B'

Without any attenuation, and allowing for a reflective environment within the light-well surrounding the condensers and the screening effect of the existing buildings and walls, we calculate the noise level outside the nearest affected window at the front of 30 St. John's Wood Park, with all the equipment in operation, to be in the order of 32dBA.

32dBA is 7.5dB above the design target of 25.5dBA, which means the noise generated by the condensers will need to be attenuated in order to meet the planning requirement.

The space available in this light well is limited, which will make the installation of an acoustic enclosure difficult. However, by installing a combination of bespoke acoustic cladding to the walls of the light well, complete with an acoustic panel shroud fitted above the condensers, it should be possible to provide the 7.5dBA of attenuation required.

Internal Plant

We believe that there may be other mechanical plant located inside basement level plant rooms.

Any ventilation openings within the plant room walls will therefore need to be considered, as will any fans that have atmospheric connections.

This may necessitate a requirement for attenuation to be incorporated within openings in the building envelope and in-line duct silencers between any fans and atmospheric grilles.

When full details of the equipment sound power levels and the equipment layouts are available we will be pleased to undertake a full acoustic analysis of this part of the project and confirm any necessary acoustic treatment.

Summary

A 24-hour noise survey has been undertaken in the rear garden of 48 Queens Grove, London NW8 and the results are published in this report.

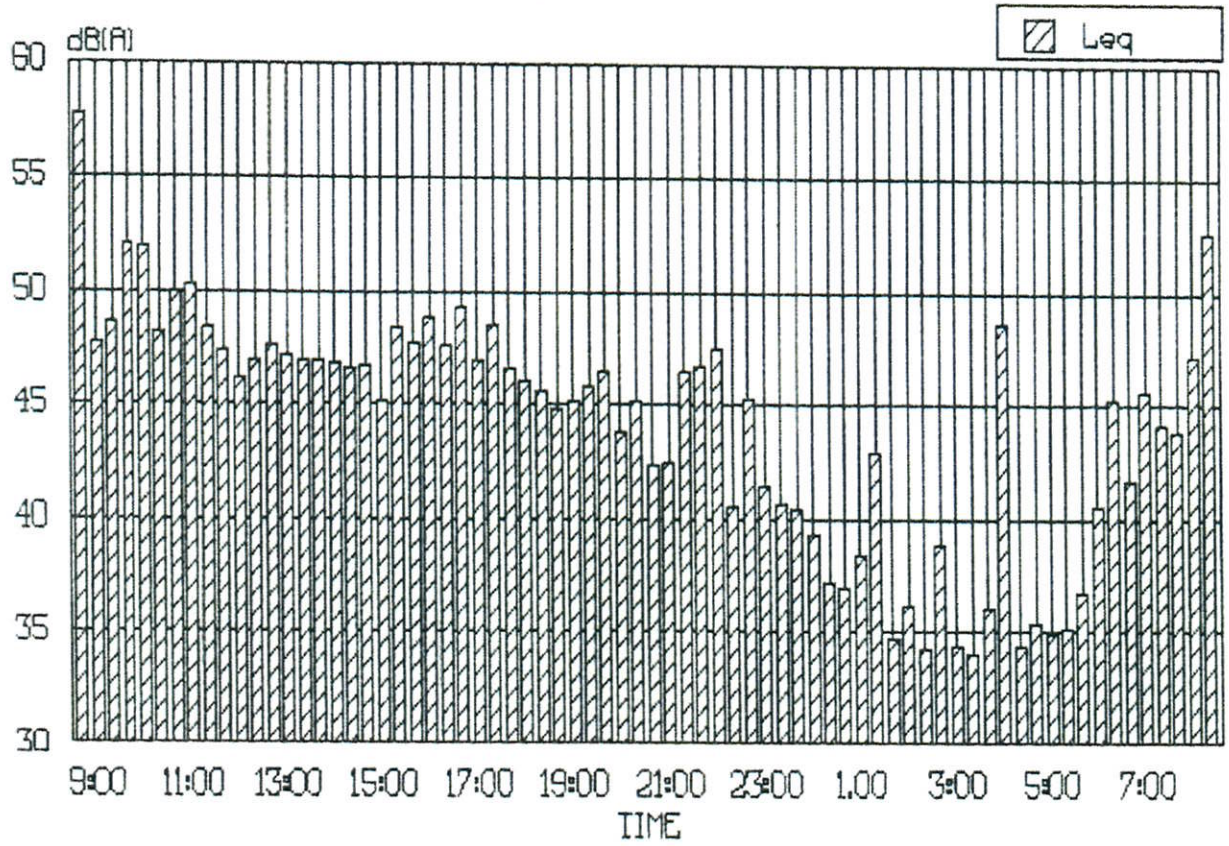
Design noise limits have been recommended based on the results of the survey and the local authority's planning criteria.

The proposed externally located plant has been analysed, and if the suggested noise control measures are adopted then the operation of the new plant should attract no justifiable complaints under the guidelines of Camden's current Unitary Development Plan.

Emtec Products Ltd. is able to assist in the design of a suitable acoustic treatment to meet the local authority's planning requirements on request.

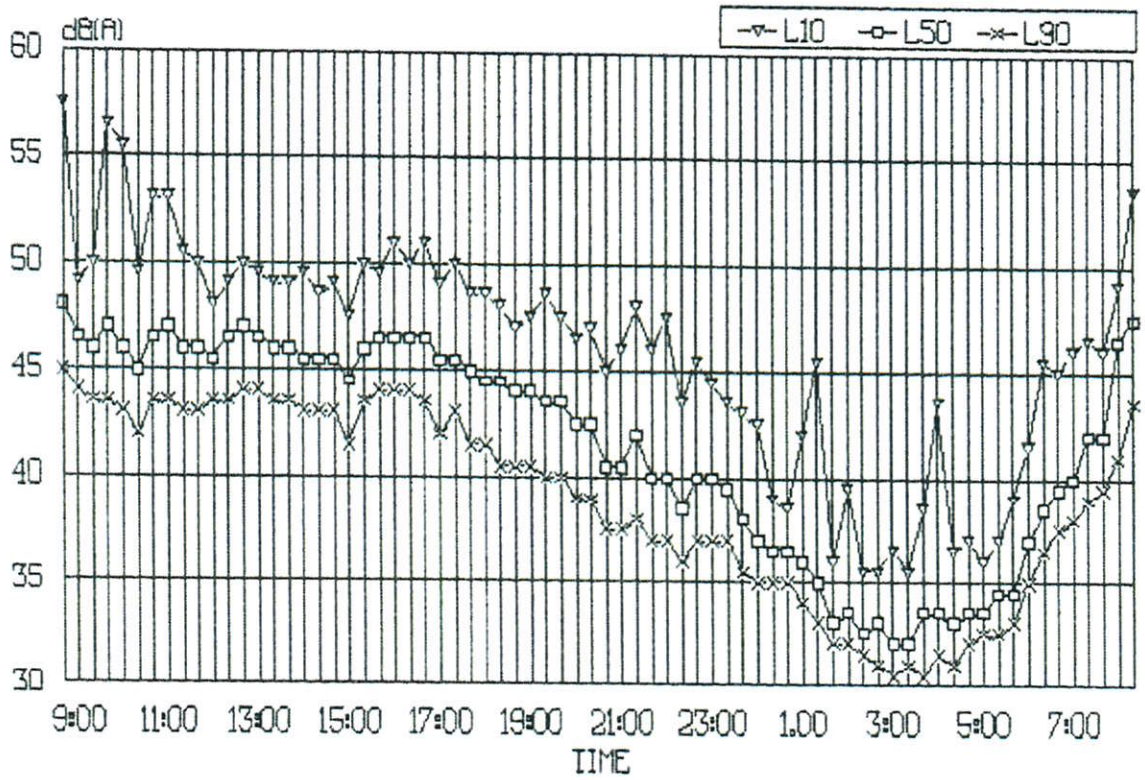
EMTEC PRODUCTS LTD
30th September 2011

48 QUEEN'S GROVE, LONDON NW8
22nd to 23rd September 2011



TITLE: LAeq Levels	*ISSUE DATE: 30/9/11*				*DRAWN BY: JRT*	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	EMTEC	
CLIENT: Appleby Trust	*PF No: 4447*				*APPROVED BY: MGR*	*REVISION*								Enterprise House, 133 Blyth Road Hayes, Middlesex UB3 1DD Tel: 020 8848 3031 Fax: 020 8573 3605	
PROJECT: 48 Queens Grove, London NW8	*Q*	*A*	*M*	*I*	*DESIGN AUTH: JRT*	*SKETCH No. QF/6142/T3*									

48 QUEEN'S GROVE, LONDON NW8
22nd to 23rd September 2011



TITLE: LA10; :A50 and LA90 Levels	*ISSUE DATE: 30/9/11*				*DRAWN BY: JRT*	*A*	*B*	*C*	*D*	*E*	*F*	*G*	*H*	EMTEC
CLIENT: Appleby Trust	*PF No: 4447*				*APPROVED BY: MGR*	*REVISION*								Enterprise House, 133 Blyth Road Hayes, Middlesex UB3 1DD Tel: 020 8848 3031 Fax: 020 8573 3605
PROJECT: 48 Queens Grove, London NW8	*Q*	*A*	*M*	*I*	*DESIGN AUTH: JRT*	*SKETCH No. QF6142/T4*								

QF6142/PF4447

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APPENDIX A

Raw Data – Noise Survey

22nd to the 23rd of September 2011

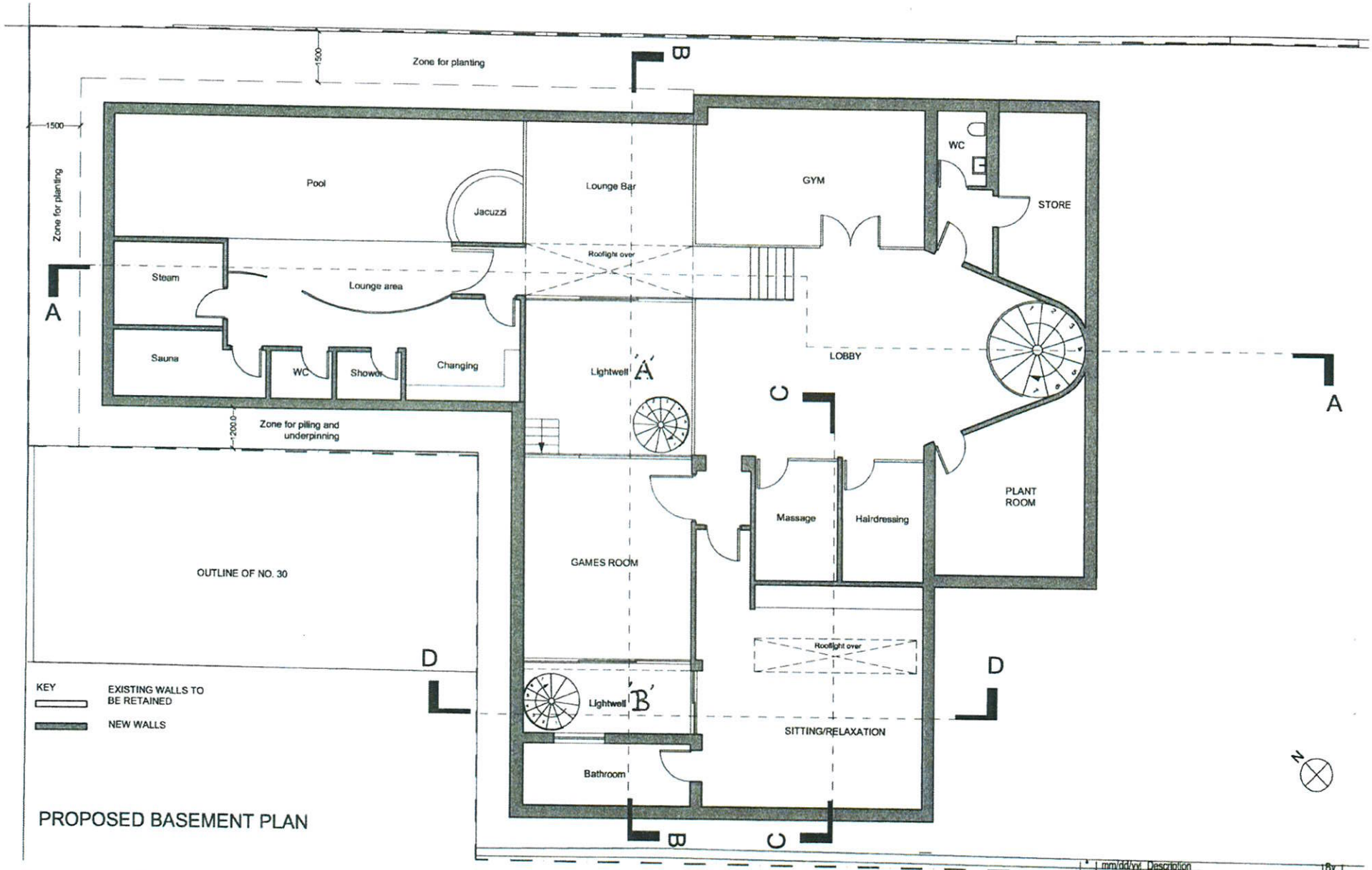
NOISE SURVEY DATA FROM BACKGROUND NOISE LEVEL SURVEY IN THE GARDEN OF THE RESIDENTIAL PROERTY AT No.46 QUEEN'S GROVE, LONDON NW8.

Project : 46 Queen's Grove, London NW8.
Client : BB Partnership.
Ref : QF6142A/PF4447
Date : 23rd September 2011

Measure No.	Finish Time	MaxP (dBA)	L1 (dBA)	L10 (dBA)	L50 (dBA)	L90 (dBA)	L99 (dBA)	Leq (dBA)
1	08:38	95.4	68.5	57.5	48	45	42.5	57.7
2	08:58	86.4	56.5	49	46.5	44	42	47.7
3	09:18	89.1	57	50	46	43.5	42	48.6
4	09:38	83.2	62	56.5	47	43.5	42	52.1
5	09:58	83.4	63	55.5	46	43	41.5	51.9
6	10:18	83	57.5	49.5	45	42	41	48.2
7	10:38	83.1	60.5	53	46.5	43.5	42	50
8	10:58	87.2	60.5	53	47	43.5	42	50.3
9	11:18	82.9	57.5	50.5	46	43	41.5	48.3
10	11:38	78.6	54.5	50	46	43	41.5	47.3
11	11:58	73.1	51.5	48	45.5	43.5	42.5	46.2
12	12:18	74.5	53	49	46.5	43.5	42.5	46.9
13	12:38	71.2	53.5	50	47	44	42.5	47.6
14	12:58	75.6	53.5	49.5	46.5	44	42.5	47.2
15	13:18	75.6	53.5	49	46	43.5	42.5	46.9
16	13:38	76.6	52.5	49	46	43.5	42	47
17	13:58	75.5	53	49.5	45.5	43	42	46.8
18	14:18	74.7	53	48.5	45.5	43	41.5	46.5
19	14:38	74.9	53.5	49	45.5	43	41.5	46.7
20	14:58	77.3	50.5	47.5	44.5	41.5	39.5	45.2
21	15:18	84.7	58	50	46	43.5	41.5	48.3
22	15:38	75.4	55.5	49.5	46.5	44	41.5	47.7
23	15:58	79.8	58.5	51	46.5	44	42	48.9
24	16:18	79.2	54.5	50	46.5	44	42	47.6
25	16:38	79.3	59	51	46.5	43.5	42	49.3
26	16:58	73.9	54	49	45.5	42	40.5	47
27	17:18	78.3	59	50	45.5	43	41.5	48.5
28	17:38	76.9	55.5	48.5	45	41.5	40.5	46.6
29	17:58	74.6	53.5	48.5	44.5	41.5	39	46
30	18:18	72.2	52	48	44.5	40.5	39	45.5
31	18:38	80.3	50.5	47	44	40.5	39	44.8
32	18:58	75.3	53	47.5	44	40.5	38.5	45.2
33	19:18	73.1	55	48.5	43.5	40	38.5	45.8
34	19:38	79.8	57	47.5	43.5	40	38	46.4
35	19:58	70.6	50	46.5	42.5	39	37.5	43.8
36	20:18	73.1	55.5	47	42.5	39	37.5	45.2
37	20:38	65.8	50.5	45	40.5	37.5	36	42.3
38	20:58	67.5	49.5	46	40.5	37.5	36.5	42.5
39	21:18	76.4	59	48	42	38	36	46.4
40	21:38	94.6	58	46	40	37	35.5	46.7
41	21:58	80.8	61	47.5	40	37	35.5	47.4
42	22:18	64.2	47.5	43.5	38.5	36	34.5	40.5
43	22:38	74.2	59	45.5	40	37	36	45.3
44	22:58	73.8	48	44.5	40	37	36	41.4
45	23:18	61	46	43.5	39.5	37	36	40.6
46	23:38	70.3	47.5	43	38	35.5	35	40.4
47	23:58	61.4	47	42.5	37	35	34.5	39.2
48	00:18	60.1	44	39	36.5	35	34	37.2
49	00:38	59.5	42	38.5	36.5	35	34	37
50	00:58	62.3	46.5	42	36	34	33	38.4
51	01:18	76	54.5	45.5	35	33	32	42.8
52	01:38	62.3	43	36	33	32	31	34.6
53	01:58	71.1	44.5	39.5	33.5	32	31	36.2
54	02:18	64.1	43.5	35.5	32.5	31.5	30.5	34.3
55	02:38	86.6	50	35.5	33	31	30	38.9
56	02:58	72.3	41.5	36.5	32	30.5	30	34.4
57	03:18	62.4	42.5	35.5	32	31	29.5	34
58	03:38	60.9	46	38.5	33.5	30.5	30	36
59	03:58	82.3	64	43.5	33.5	31.5	31	48.6
60	04:18	66.1	42.5	36.5	33	31	30.5	34.4
61	04:38	70.8	44.5	37	33.5	32	31	35.4
62	04:58	68.2	43	36	33.5	32.5	31.5	34.9
63	05:18	62.1	42	37	34.5	32.5	31.5	35.1
64	05:38	70	45	39	34.5	33	32.5	36.7
65	05:58	66.6	52	41.5	37	35	34	40.5
66	06:18	86.1	55	45.5	38.5	36.5	35.5	45.3
67	06:38	80	50	45	39.5	37.5	36	41.7
68	06:58	77.8	57.5	46	40	38	37	45.5
69	07:18	70.7	53.5	46.5	42	39	37.5	44.1
70	07:38	74.2	52	46	42	39.5	38.5	43.8
71	07:58	83.8	54	49	46.5	41	39	47.2
72	08:18	91.7	63	53.5	47.5	43.5	42	52.7

APPENDIX B

- Basement plan of 48 Queens Grove showing light wells A and B
- Ground floor plan of 48 Queens Grove showing location of the noise survey 'X'



PROPOSED BASEMENT PLAN

SCHEME DESIGN SUBJECT TO STRUCTURAL ENGINEER /SERVICES ENGINEER, & PLANNERS COMMENT

FOR PLANNING

2 4 6 8 10 METRES

Subject to detailed dimensional survey -Please note these drawings are based on existing drawings prepared by others. BB Partnership cannot be held responsible for any discrepancies and/or inaccuracy that may arise

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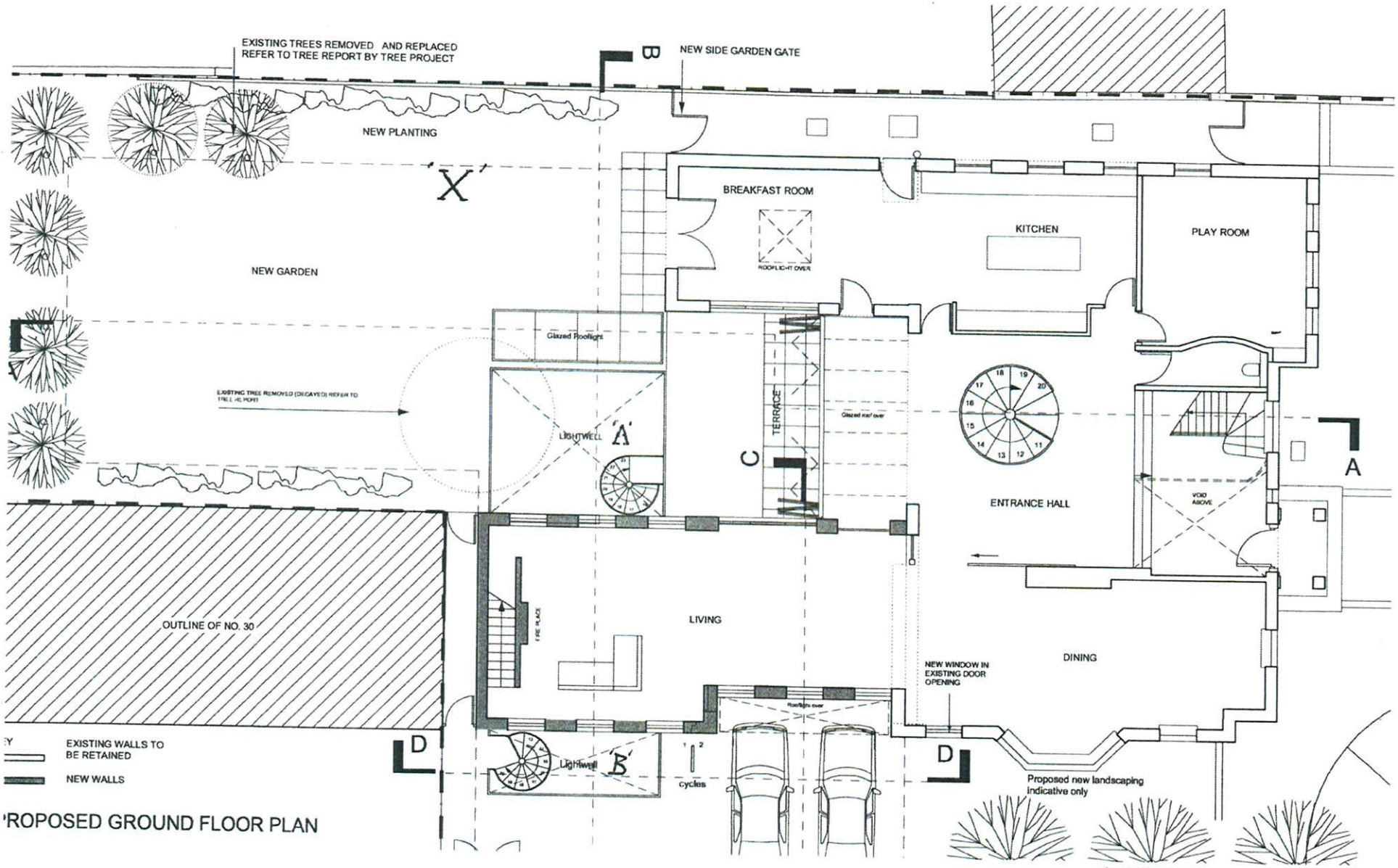
mm/dd/yy	Description	By
	Description	

project	48 QUEENS GROVE FACADE RETENTION	date 08/11	scale 1:100@A3	drawn by ST
drawing	Proposed Basement Floor Plan	drwg. no EWA_201	rev	

do not scale . check all dimensions on site ©



PROPOSED GROUND FLOOR PLAN

SCHEME DESIGN SUBJECT TO STRUCTURAL ENGINEER /SERVICES ENGINEER, & PLANNERS COMMENT

FOR PLANNING

1 2 4 6 8 10 METRES

Subject to detailed dimensional survey -Please note these drawings are based on existing drawings prepared by others. BB Partnership cannot be held responsible for any discrepancies and/or inaccuracy that may arise

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project	48 QUEENS GROVE FACADE RETENTION	date 08/11	scale 1:100@A3	drawn by ST
drawing	Proposed Ground Floor Plan	drwg. no EWA_202	rev	

	mm/dd/yy	Description	Description	By

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