H&H Acoustic Consultancy Division

Exeter, Glasgow, Hadleigh, High Wycombe, Northwich, Old Dalby

HHACY Ref: HHACY/8826/02b/MJL
Date: 8th July 2008

Environmental Noise Assessment:
"Hatfield Phase 4", Mosquito Way,
Hertfordshire.

CLIENT: Bovis Homes (Central Region) Limited
Bromwich Court
Highway Point
Gorsey Lane
Coleshill
B46 1 JU

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CONTENTS

1. BRIEF FOR CONSULTANCY

- Travel to the "Hatfield Phase 4" site along Mosquito Way and set up noise monitoring equipment to measure the existing noise environment over a 24-hour period.
- Whilst on site during the day take additional sample noise measurements at various positions to include octave band frequency data.
- Analyse the site noise data and determine the daytime and night-time $L_{Aeq,T}$ and the maximum noise levels affecting the site. Determine the noise levels affecting the site during the day and night to establish the Noise Exposure Category of the site in accordance with PPG24.
- Using the data obtained, predict amenity external and habitable room internal noise levels for the proposed development.
- Make recommendations to ensure that internal noise levels meet the required Local Authority criteria.
- Set out the findings in a technical report suitable for submission to the Local Authority.
- Following the receipt of a change to the site layout, the report has been revised to consider new plot numbers.

2. SUMMARY

The existing noise environment at the "Hatfield Phase 4" site was measured in terms of L_{Aeq}, L_{A10}, L_{A90} and L_{Amax} over a 24-hour period during a typical weekday period.

The Noise Exposure Category of the site is NEC B during the day and night. Mitigation measures to reduce noise should therefore be taken into account on the new development.

Internal noise levels have been predicted and compared with the Local Authority criteria. These predictions indicate that most plots will be adequate with standard thermal double glazed windows closed (minimum R_w35) and a good standard of acoustic trickle vent. For **bedrooms** with a facade facing Mosquito Way on plots 19 – 46 and 146 – 164 enhanced glazing with a minimum R_w38 with an acoustic trickle vent should be fitted.

External garden/amenity noise levels are predicted to fall within the World Health Organisation recommendations of 55dB(A) during the day.

If the above acoustic measures are taken into account then internal noise levels are predicted to meet the relevant criteria.

3. INTRODUCTION

Our client proposes to develop land at "Hatfield Phase 4", off Mosquito Way, Hertfordshire, for the purpose of residential development.

The site is currently derelict, but used for storage for the development across the road.

The site is adjacent to Mosquito Way that gives access to the whole area which is being redeveloped for residential purposes.

To the south of the site is a fairly new Business park with offices and car parking facilities. To the north of the site is a leisure facility with external tennis courts and a swimming pool.

There is some plant noise from the leisure facility and from the offices that could be heard above the existing noise environment.

Figure 1 of this report shows the location of the site in relation to the surrounding area.

Hodgson & Hodgson Acoustic Consultancy Division (formally Acoustic Design Consultants (ADC)) has been commissioned to undertake an environmental noise assessment of the proposed development.

This report presents the survey details, results and a comparison with the relevant guidance.

4. LOCAL AUTHORITY NOISE CRITERIA

Discussions with the Local Authority have determined that the site needs to be assessed in accordance with PPG24 (ref.1) and criteria given in BS8233:1999 (ref. 2).

PPG24 requires the noise environment to be measured over a 24-hour period in terms of L_{Aeq}. The day and night-time results can then be compared with the Noise Exposure Categories as defined in PPG24, for road traffic, as this is the dominant noise source. This is described later in **Section 7** of this report.

BS8233:1999 recommends criteria for day and night-time periods. The criteria used in this assessment are shown below.

Daytime internal	-	35dB $L_{Aeq,16\ hr}$
Amenity external	-	55dB $L_{Aeq,16\ hr}$
Night-time internal	-	30dB $L_{Aeq,8\ hr}$
Night-time internal	-	45dB L_{Amax}

The above has been considered in all calculations.

5. SURVEY DETAILS

Two environmental monitors were set up on Wednesday 13th June to measure the existing noise environment over a typical 24-hour weekday period.

Position 1 (**P1**) was located towards the south of the site adjacent to the car park of the Business Park. Hourly measurements were taken. This position was affected mainly by car park activities and road traffic along Mosquito Way. Some plant could just be heard from the offices which are likely to be air-conditioning. There was distant construction site noise also.

Position 2 (**P2**) was located to the north of the site along the boundary with the Leisure Facility. This position had line of sight to the plant at the end of the building, the swimming pool and the tennis courts. Construction site noise could also be heard to the north and to the west of the site.

Sample noise measurements (a to f) were taken to obtain octave band frequency data of various noise sources.

All measurement positions are shown on **Figure 1**.

Details of the equipment used and the personnel present, etc. are given in **Appendix 1**.

6. SURVEY RESULTS

Table 1: A summary of the existing noise levels affecting the site over a 24-hour period at monitoring positions **P1** and **P2**. The arithmetic averages have been shown.

Summary of 24-Hour Noise Levels Recorded – dB(A)

Position	Daytime (0700 to 2300 hrs)				Nighttime (2300 to 0700 hrs)			
	L_{Aeq}	L_{Amax}	L_{A10}	L_{A90}	L_{Aeq}	L_{Amax}	L_{A10}	L_{A90}
P1	53	64-84	55	48	46	58-67	48	43
P2	52	59-84	54	50	46	53-71	47	44

Table 2: Presents the sample L_{Aeq} and L_{Amax} survey results measured across the site. The locations of monitoring positions are shown on **Figure 1**.

Table 2
Sample Noise Levels Recorded Across The Site
(5-minute Samples)

Position	dBL_{Aeq}	dBL_{Amax}	Comments
a	52	59, 61	Near **P2**: leisure facility
b	51	61	Tennis court noise
c	48	57	Road traffic near to north
d	57	69	Road traffic, r-a-bout
e	51	62	Near **P1**: car park
f	44, 51, 48	48, 60, 61	Adjacent to car park, plant.

Typical octave band frequency data from the general noise environment are illustrated in **Appendix 3** of this report.

7. NOISE EXPOSURE CATEGORIES

The 24-hour noise levels measured on site have been divided into day and night-time periods so that the Noise Exposure Category can be given. The NEC for a site dominated by road traffic / mixed noise is summarised below in **Table 3**. However, road traffic is considered to be the dominant noise source.

Table 3
Noise Exposure Categories for a Site
Dominated by Road Traffic

Noise Levels Corresponding to the Noise Exposure Category For New Dwellings $L_{Aeq,T}$ dB				
	Noise Exposure Category			
Noise Source: road traffic	**A**	**B**	**C**	**D**
0700 – 2300 hrs	<55	55-63	63-72	>72
2300 – 0700 hrs	<45	45-57	57-66	>66

The day and night-time arithmetic $L_{Aeq's}$ along with the Noise Exposure Category of the site is shown in Table 4. Position 1 measurements have been predicted back to the closest proposed façade adjacent to the road to determine the NEC.

Table 4
Noise Exposure Category of Site – dB(A)

Monitoring Position	dB L_{Aeq}	NEC
P1 (predicted): day	59	B
Night	52	B
P2: day	52	A
Night	46	B

The site falls within NEC B during the day and night. PPG24 describes a site that falls within NEC B as follows:

> NEC B *"Noise should be taken into account when determining planning applications and, where appropriate, conditions imposed to ensure an adequate level of protection against noise."*

8. PREDICTED GARDEN AND INTERNAL NOISE LEVELS

PPG24 refers to BS8233:1999 within which internal dwelling and external garden noise levels are recommended. The recommended criteria mentioned previously in **Section 4**, will be used in all subsequent calculations.

The following plots have been considered in the analysis of external/amenity and internal habitable room noise levels.

Figure 2 shows the proposed site layout with prediction positions.

Plot 40 – 46 - Close to Mosquito Way.
Plot 109 – 116 - Adjacent to Leisure Centre.
Plot 62 – 63 - Adjacent to business park car park.

All calculations are presented in terms of $L_{Aeq,T}$ and L_{Amax}.

8.1 External Garden/Amenity Noise Levels:

Garden noise levels are usually taken to be during the day (0700 - 2300 hrs), as this is the time period they are generally in use.

Distance corrections, angle of view, screening from fencing or the actual dwelling itself, have been considered where appropriate.

Table 5: summarises the predicted garden/amenity noise level to the plots considered.

Table 5
Predicted Garden/Amenity Noise Levels – dB(A)

Plot No.	Garden Level – $L_{Aeq,T}$
Plot 40 – 46	54
Plot 109 – 116	53
Plot 62 – 63	49
(Criterion)	*(55 dB $L_{Aeq,16\ hrs}$)*

Garden / amenity external noise levels are predicted to fall within the required criterion of 55dB $L_{Aeq,16\ hr}$.

8.2 Internal Noise Levels:

Daytime $L_{Aeq,T}$ and night-time $L_{Aeq,T}$ and L_{Amax} have been predicted internally to habitable rooms using single dB(A) figures.

Screening and a distance correction have been considered in the calculations where necessary. Standard 4/20/4mm double-glazed units closed and good trickle vents open have been taken into account.

Maximum noise levels of 78dB(A) close to Mosquito Way and 71dB(A) at P2 have been used in the calculations during the night.

Table 6: shows the predicted internal noise levels during the day and night to each plot considered. The relevant criteria are also shown.

Table 6
Predicted Internal Noise Levels – dB(A)
4/20/4mm Glazing Closed and Trickle Vent Open

Plot No.	Day $L_{Aeq,T}$ (0700-2300)	Night $L_{Aeq,T}$ (2300-0700)	Night L_{Amax} (2300-0700)
Plot 40 – 46	29	23	48
Plot 109 – 116	23	17	41
Plot 62 – 63	23	17	37
(Criteria)	*(35 dB(A))*	*(30 dB(A))*	*(45 dB(A))*

Those plots highlighted in **bold** exceed the recommended maximum criterion at night.

To meet the night time L_{Amax} criteria, **bedrooms** that have a façade facing Mosquito Way on Plots 19 – 46 and 146 – 164 must be fitted with enhanced glazing with a minimum R_w38 with a good acoustic trickle vent.

Figure 3: Shows the Glazing and Ventilation Scheme

Typical glazing and ventilation configurations that will meet the sound reduction requirements are shown in the recommendations.

9. RECOMMENDATIONS AND CONCLUSIONS

The existing noise environment at the "Phase 4" site, Mosquito Way, Hatfield was measured in terms of L_{Aeq}, L_{A10}, L_{A90} and L_{Amax} over a 24-hour period during a typical weekday period.

The Noise Exposure Category of the site is NEC B during the day and night. Internal noise levels have been predicted and compared with the Local Authority criteria.

Internal noise predictions indicate that most plots will fall within the Local Authority criteria during the day and night. Bedrooms in Plots 19 – 46 and 146 – 164 that have a façade facing Mosquito Way will require enhanced glazing with a minimum R_w38 and good acoustic trickle ventilation.

Predicted external garden/amenity noise levels are predicted to fall within the World Health Organisation recommendations of 55dB(A) during the day.

The minimum sound reduction required for standard glazing is R_w35, such as 4/20/4mm.

Enhanced glazing must have a minimum R_w 38. Configurations may include, but are not limited to, 10/12/6mm or 6/16/6.8 Pilkington Insulight with K glass.

The above glazing configurations are examples only. Other glazing configurations may be used as long as they meet or exceed the above R_w specifications.

Table 7: Gives an example of the minimum Dne requirements for trickle ventilation.

Table 7
Trickle Vent Requirements (Dne)

	Octave Band Centre Frequency (Hz)					
T-Vent	**125**	**250**	**500**	**1k**	**2k**	**4k**
Example:Trimvent Select S16	31.9	33.8	36.5	33.6	34	34

Plant noise from the Leisure centre and business park was just audible during the day, but not measurable against the existing noise environment. Ambient noise levels at night with standard thermal double glazed units closed include any possible plant noise and so have been taken into account already. Sample measurements close to plant do not appear to contain any discernable tonal characteristics.

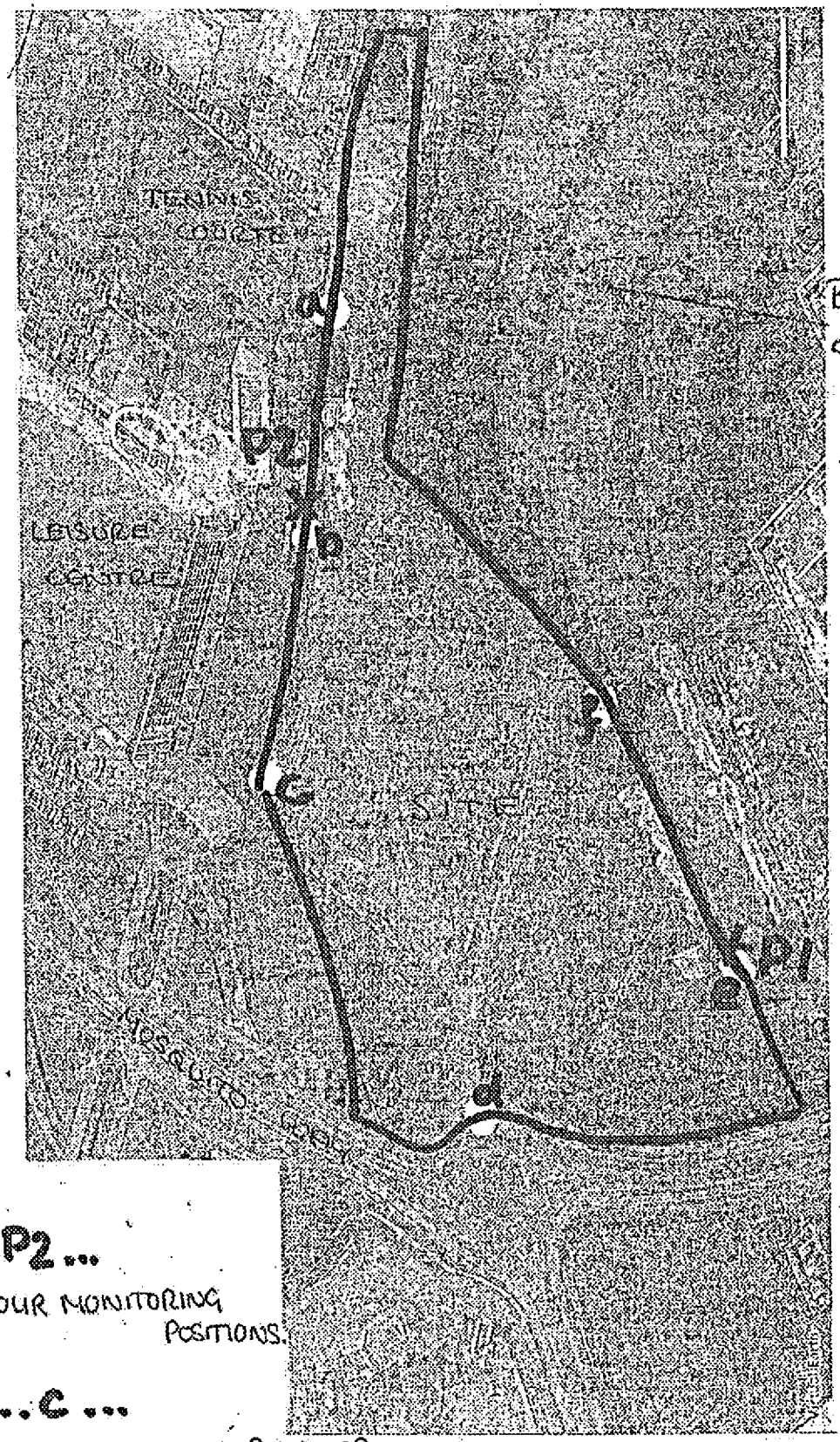
Noise levels measured from tennis activities are not expected to have a significant impact as associated maxima's are relatively low.

10. REFERENCES

1. Planning Policy Guidance 24 "Planning and Noise" 1994.

2. BS8233:1999 "Sound reduction for buildings"

FIGURE 1
Site Location and Monitoring Positions



x P1..P2...
24-HOUR MONITORING POSITIONS.

a..b..c...
SAMPLE MONITORING POINTS.

Figure 2: Proposed site layout and Prediction Positions

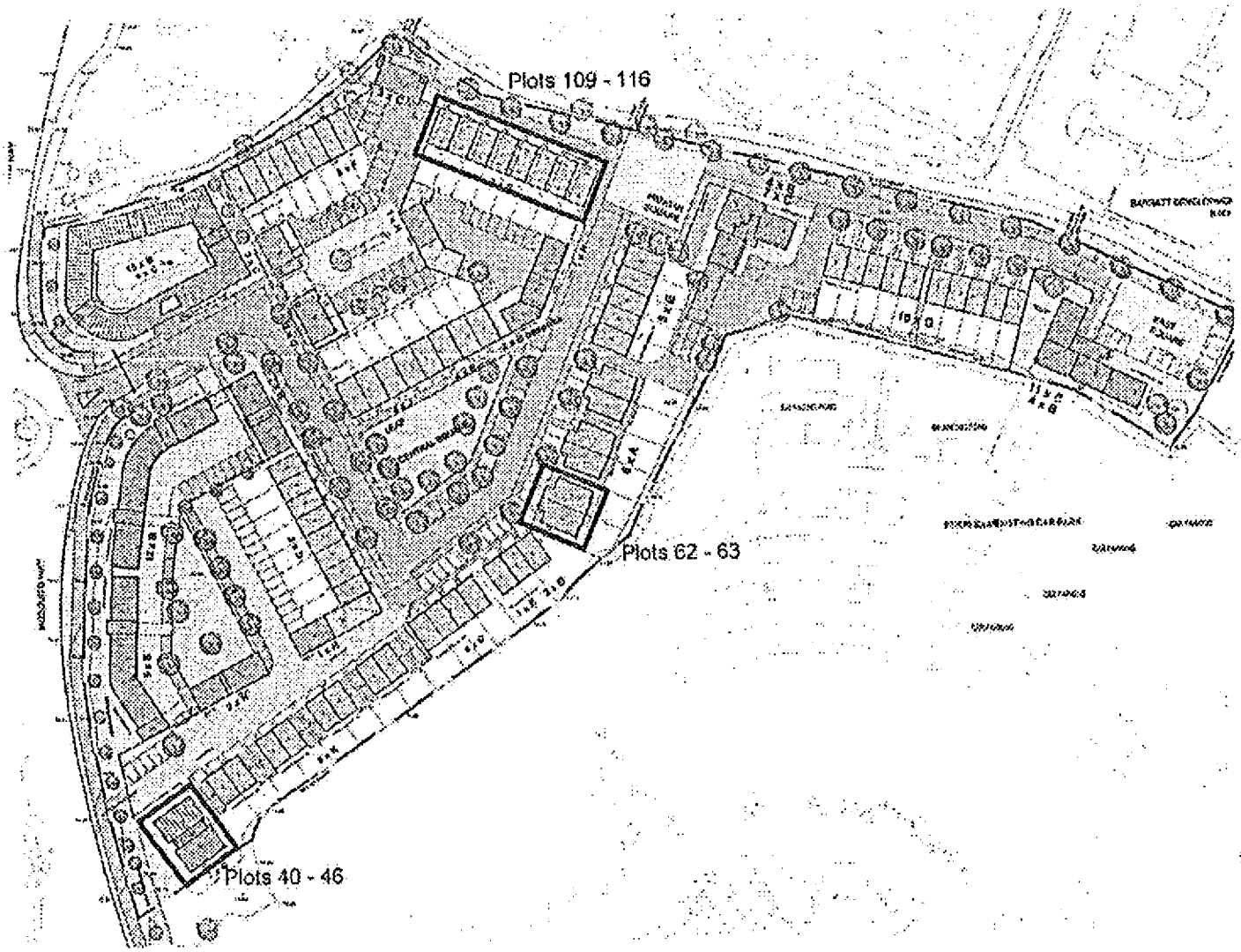


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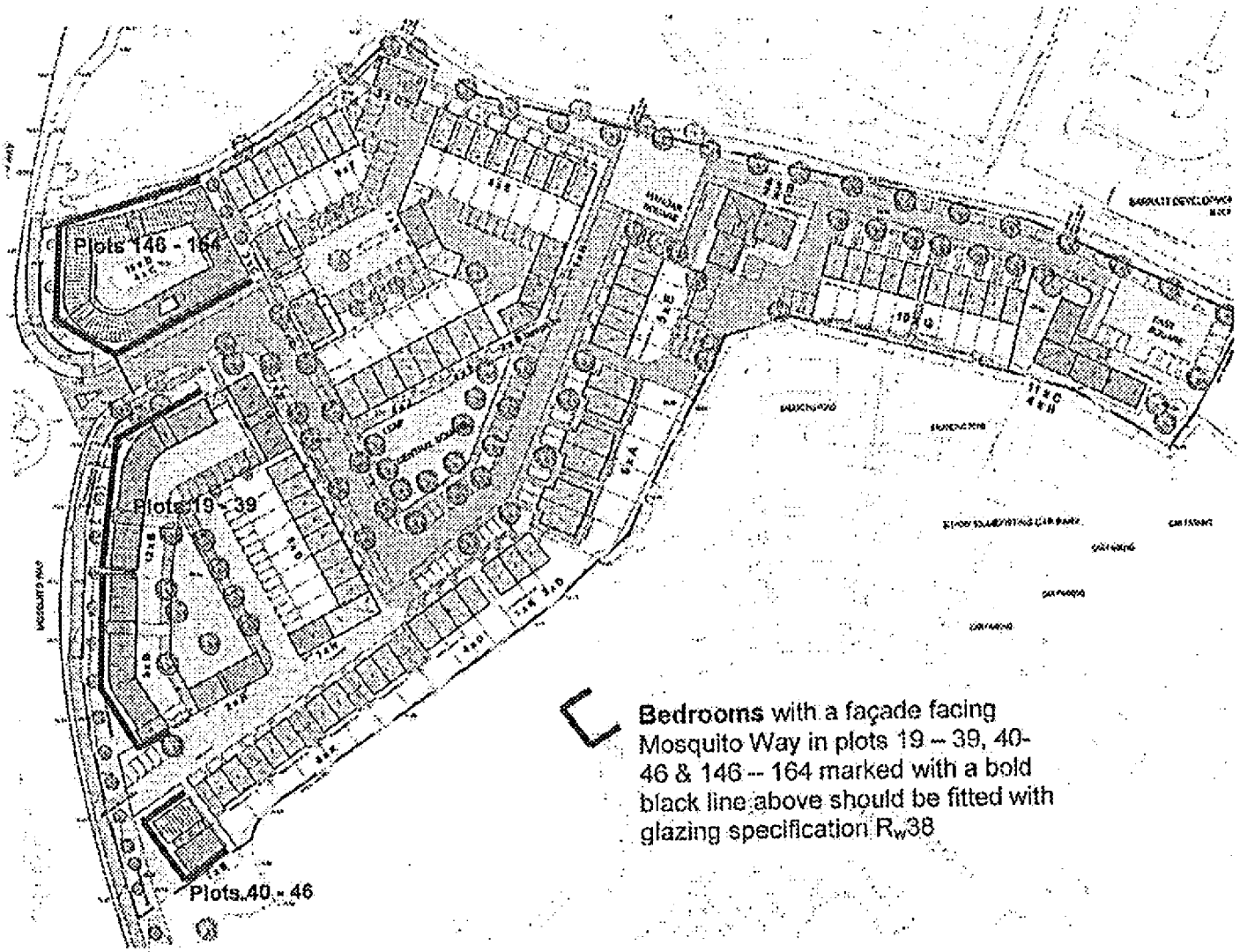
Figure 3: Glazing and Ventilation Scheme



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APPENDIX 1

Survey Details

A1.1 Dates:

Wednesday 13th June to Thursday 14th June 2007

A1.2 Location:

"Phase 4", Mosquito Way, Hatfield.

A1.3 Personnel Present:

Rachel Grant	-	Acoustic Design Consultants
Josh Boatman	-	Acoustic Design Consultants

A1.4 Weather:

Dry and bright, slight breeze. Very warm.

A1.5 Instrumentation:

Make	Description	Model
Cirrus	Type 1 Sound Level Meter x 2	CR: 821 A
Cirrus	Calibrator	CR: 513A
CEL	Type 1 Sound Level Meter	573

APPENDIX 2
Survey Results

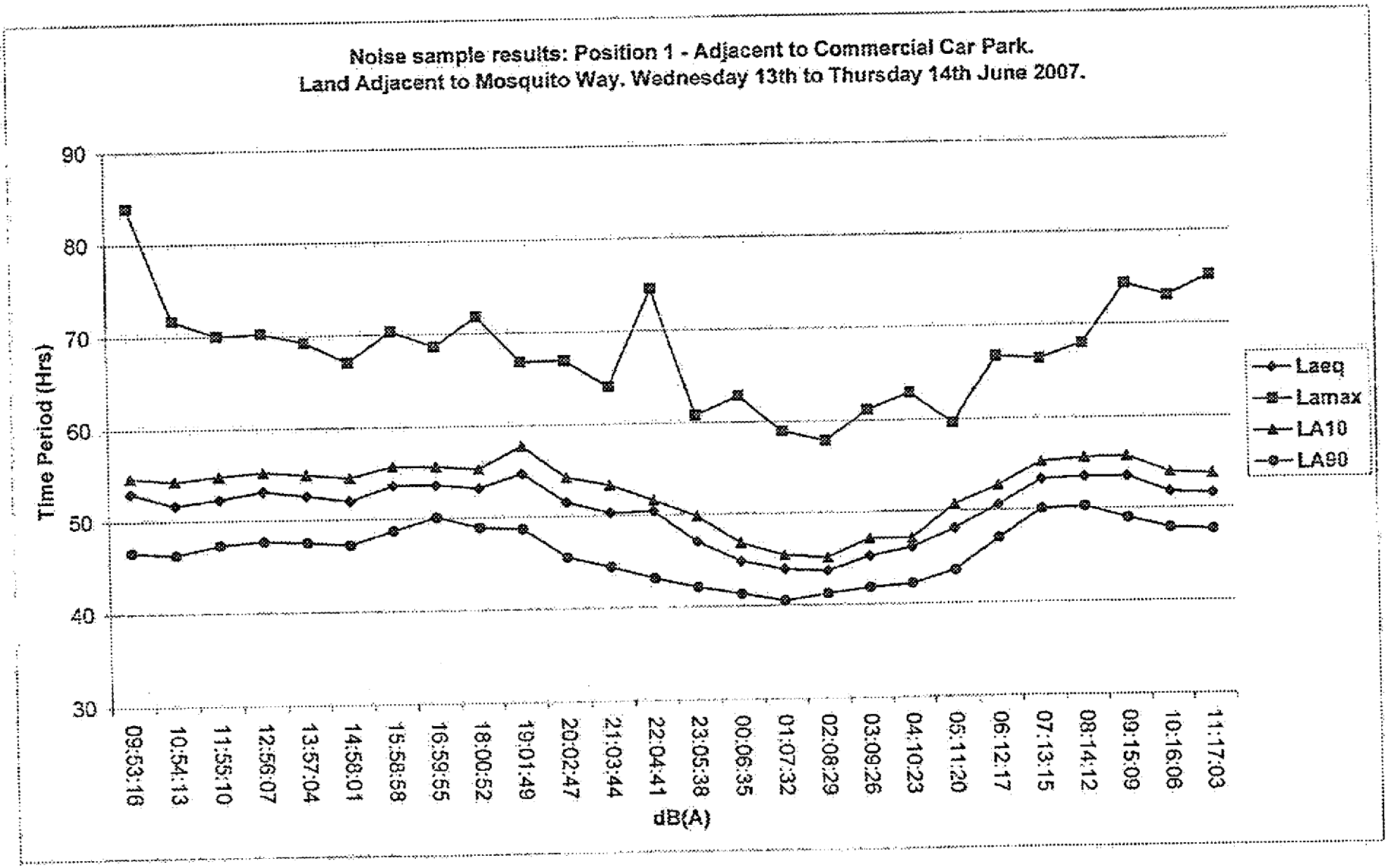
Position 1 - Adjacent to Commercial Car Park

Date	Time	Laeq	Lamax	LA10	LA90
13/06/2007	09:53:16	53	83.9	54.7	46.6
13/06/2007	10:54:13	51.7	71.7	54.3	46.3
13/06/2007	11:55:10	52.3	70	54.8	47.3
13/06/2007	12:56:07	53.1	70.2	55.2	47.7
13/06/2007	13:57:04	52.6	69.2	54.9	47.5
13/06/2007	14:58:01	52	67	54.5	47.2
13/06/2007	15:58:58	53.6	70.3	55.7	48.7
13/06/2007	16:59:55	53.6	68.6	55.6	50.1
13/06/2007	18:00:52	53.2	71.8	55.3	48.9
13/06/2007	19:01:49	54.7	66.8	57.7	48.7
13/06/2007	20:02:47	51.5	66.9	54.2	45.5
13/06/2007	21:03:44	50.3	64	53.3	44.4
13/06/2007	22:04:41	50.4	74.5	51.6	43.1
13/06/2007	23:05:38	47	60.8	49.8	42.1
14/06/2007	00:06:35	44.8	62.8	46.8	41.3
14/06/2007	01:07:32	43.9	58.9	45.4	40.5
14/06/2007	02:08:29	43.7	57.8	45.1	41.2
14/06/2007	03:09:26	45.2	61.1	47.1	41.8
14/06/2007	04:10:23	46.1	62.9	47.1	42.2
14/06/2007	05:11:20	48.1	59.6	50.7	43.6
14/06/2007	06:12:17	50.6	66.7	52.7	47
14/06/2007	07:13:15	53.3	66.4	55.2	50.1
14/06/2007	08:14:12	53.5	68	55.6	50.3
14/06/2007	09:15:09	53.5	74.4	55.7	49
14/06/2007	10:16:06	51.8	73.1	53.9	47.9
14/06/2007	11:17:03	51.6	75.2	53.7	47.7

Arithmetic Averages:					
	Day	52.5	64.0 to 83.9	54.8	47.6
	Night	46.2	57.8 to 66.7	48.1	42.5

Logarithmic Averages:		
	Day	52.7
	Night	46.8

APPENDIX 2
Survey Results



APPENDIX 2
Survey Results

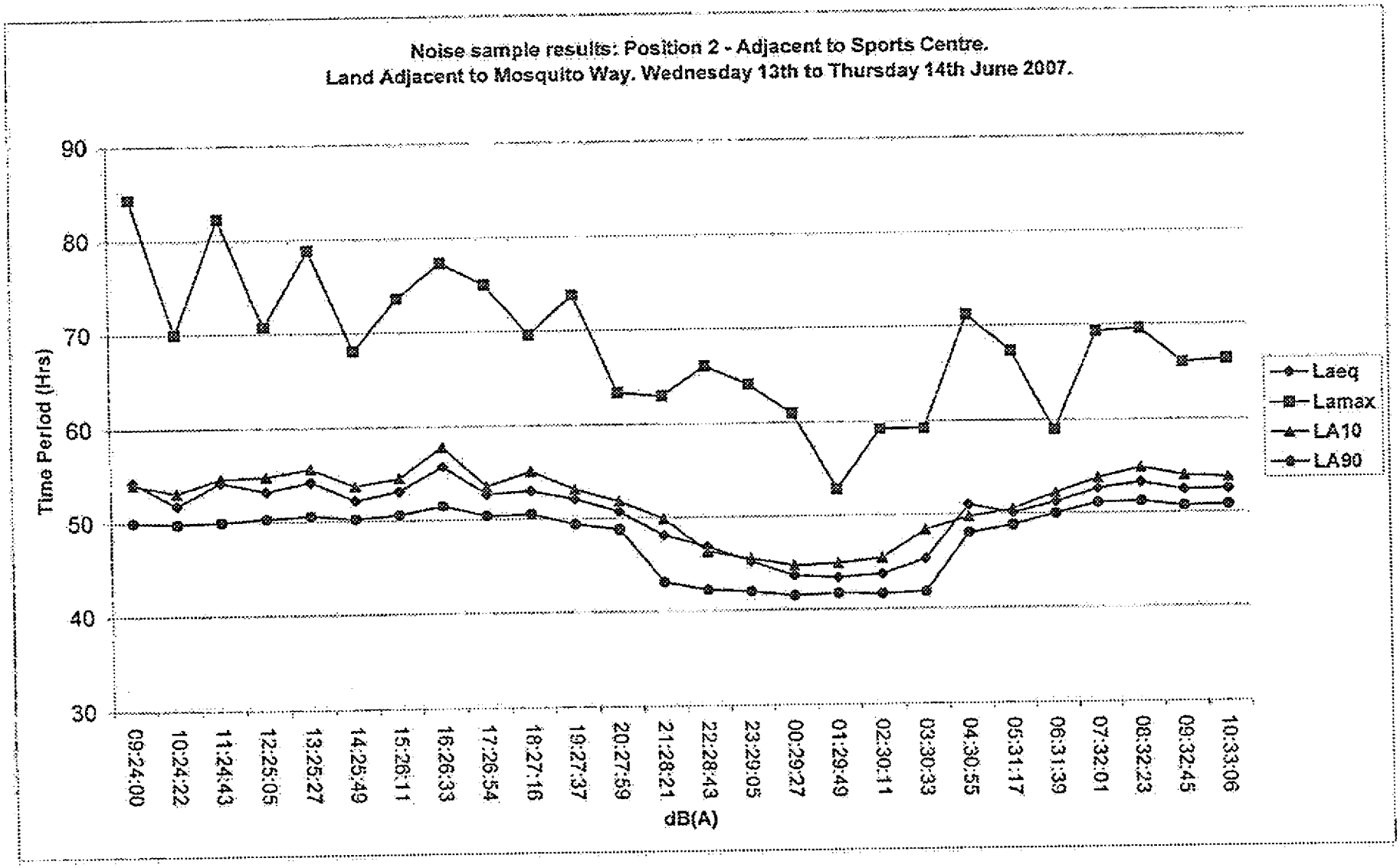
Position 2 - Adjacent to Sports Centre

Date	Time	Laeq	Lamax	LA10	LA90
13/06/2007	09:24:00	54.3	84.3	54	50
13/06/2007	10:24:22	51.8	70	53.1	49.8
13/06/2007	11:24:43	54.2	82.2	54.6	50
13/06/2007	12:25:05	53.2	70.7	54.8	50.3
13/06/2007	13:25:27	54.2	78.8	55.6	50.6
13/06/2007	14:25:49	52.2	68.1	53.7	50.2
13/06/2007	15:26:11	53.1	73.6	54.5	50.6
13/06/2007	16:26:33	55.7	77.3	57.8	51.5
13/06/2007	17:26:54	52.7	75	53.5	50.4
13/06/2007	18:27:16	53	69.6	55.1	50.5
13/06/2007	19:27:37	52.1	73.8	53.1	49.4
13/06/2007	20:27:59	50.7	63.4	51.8	48.8
13/06/2007	21:28:21	48.1	63	49.9	43.1
13/06/2007	22:28:43	46.8	66.1	48.3	42.2
13/06/2007	23:29:05	45.2	64.1	45.5	42
14/06/2007	00:29:27	43.6	61	44.7	41.5
14/06/2007	01:29:49	43.4	52.8	44.9	41.7
14/06/2007	02:30:11	43.7	59.2	45.4	41.6
14/06/2007	03:30:33	45.3	59.2	48.4	41.8
14/06/2007	04:30:55	51	71.2	49.7	48
14/06/2007	05:31:17	50.1	67.3	50.5	48.8
14/06/2007	06:31:39	51.2	58.9	52.2	50
14/06/2007	07:32:01	52.6	69.3	53.7	51.1
14/06/2007	08:32:23	53.2	69.6	54.8	51.2
14/06/2007	09:32:45	52.4	66	53.9	50.7
14/06/2007	10:33:06	52.5	66.3	53.7	50.8

Arithmetic Averages:					
	Day	52.3	58.9 to 84.3	53.5	49.5
	Night	46.0	52.8 to 71.2	47.0	43.6

Logarithmic Averages:		
	Day	52.7
	Night	47.2

APPENDIX 2
SURVEY RESULTS



APPENDIX 3
Sample Survey Results

Position a: Short sample near to P2

Run start 13/06/2007 10:24
Run end 13/06/2007 10:25
Run duration 000 00:00:35.86

Band (Hz)	Fw	Leq	Lmax	L10	L90
Broadband	L	72.5	79	75	69
Broadband	A	51.6	58.9	53	50
16	L	63.3	73.7	66	58
32	L	64.2	69.9	66	61
63	L	64.1	68.8	66	62
125	L	57.6	65.4	61	53
250	L	45.8	60.3	47	43
500	L	46.7	55.3	48	45
1k	L	47.2	52.6	48	45
2k	L	44.3	53.6	46	42
4k	L	40.8	54.4	43	35
8k	L	36.3	51.5	39	27
16k	L	28.6	46.5	31	---.-

Position b: Tennis noise sample

Record start 13/06/2007 10:26

Band (Hz)	Fw	Leq	Lmax	L10	L90
Broadband	L	67.5	74.3	69	65
Broadband	A	50.6	61.4	52	49
16	L	59.2	72.7	62	54
32	L	63.9	73	67	60
63	L	62.4	68.5	65	59
125	L	52.4	64.2	54	50
250	L	44	58.3	45	42
500	L	48.1	58.9	49	46
1k	L	47	59.8	48	45
2k	L	42.5	52.7	44	41
4k	L	36.2	52.8	37	32
8k	L	28.9	52.6	29	---.-
16k	L	---.-	53.3	---.-	---.-

Position a: Next to P2. Plant noise evident

Record start 13/06/2007 10:32

Band (Hz)	Fw	Leq	Lmax	L10	L90
Broadband	L	70.1	78.6	72	67
Broadband	A	52	61	54	50
16	L	61.1	73	64	56
32	L	65	71.1	67	62
63	L	64.2	72.6	66	62
125	L	56.7	70.1	59	53
250	L	49.8	64	53	45
500	L	47.6	54.5	49	46
1k	L	47.8	55.5	49	46
2k	L	43.9	55	45	42
4k	L	41	59.2	44	34
8k	L	32.9	53	36	25
16k	L	---.-	47.8	---.-	---.-

APPENDIX 3
Sample Survey Results

Position c: Road traffic noise near to Leisure Centre

Record start 13/06/2007 10:37

Band (Hz)	Fw	Leq	Lmax	L10	L90
Broadband	L	66.8	77.5	69	64
Broadband	A	47.6	56.9	50	44
16	L	58.4	70.6	61	54
32	L	62.3	70.6	65	59
63	L	61.7	68.6	64	59
125	L	53.4	63.6	56	50
250	L	47.1	60.9	50	41
500	L	43.5	56.5	46	39
1k	L	43.4	48.9	45	41
2k	L	39	53.6	41	36
4k	L	32.5	50.1	34	27
8k	L	31	48.4	33	---.-
16k	L	---.-	40.4	---.-	---.-

Position d: Adjacent to round-a-bout at site entrance

Record start 13/06/2007 10:44

Band (Hz)	Fw	Leq	Lmax	L10	L90
Broadband	L	73	86.6	76	68
Broadband	A	57.3	69	61	47
16	L	64.1	81.8	67	58
32	L	64.9	78.2	68	61
63	L	68.4	79.7	72	61
125	L	61.8	73.6	66	53
250	L	56.7	69.6	61	45
500	L	53	66.4	57	40
1k	L	53.2	66.4	57	42
2k	L	49.3	63.7	53	37
4k	L	43.5	59.7	47	31
8K	L	36.8	57.8	41	---.-
16k	L	27.1	52.6	30	---.-

Position e: Next to Position 1, carpark

Record start 13/06/2007 10:52

Band (Hz)	Fw	Leq	Lmax	L10	L90
Broadband	L	70.6	83.4	73	66
Broadband	A	51.1	61.8	54	46
16	L	60.2	78.6	62	55
32	L	63.6	75.1	66	59
63	L	68.2	83.3	71	61
125	L	58.3	69.1	62	52
250	L	50.7	62.5	53	46
500	L	45.1	57.1	48	40
1k	L	47.1	59.5	50	41
2k	L	42.2	53	46	36
4k	L	35.3	52.5	38	28
8k	L	27.8	55.7	30	---.-
16k	L	---.-	52.9	---.-	---.-

APPENDIX 3
Sample Survey Results

Position f: Adjacent to car park but further from road. Plant noise

Record start 13/06/2007 10:58

Band (Hz)	Fw	Leq	Lmax	L10	L90
Broadband	L	67.7	74.3	69	65
Broadband	A	44.3	48.3	45	43
16	L	60.9	72.2	63	55
32	L	63.2	69.7	65	60
63	L	62.5	67.9	65	60
125	L	51.9	58.4	54	49
250	L	43.3	53.5	45	41
500	L	40	45.2	41	39
1k	L	39.6	42.9	41	38
2k	L	35	38.5	36	34
4k	L	28.6	37.8	31	25
8k	L	---.-	34.5	26	---.-
16k	L	---.-	31.2	---.-	---.-

Position f: Adjacent to car park but further from road. Plant noise

Band (Hz)	Fw	Leq	Lmax	L10	L90
Broadband	L	68.5	76.1	71	65
Broadband	A	50.9	60.4	55	44
12	L	57.1	71.2	59	49
16	L	54.7	63.6	57	49
20	L	54.4	62	58	49
25	L	56.2	64	59	52
32	L	57.5	62.3	60	53
40	L	56	63.3	59	51
50	L	57.8	62.9	60	54
63	L	54.6	61.6	57	51
80	L	49.8	55.5	52	47
100	L	47.9	51.8	50	45
125	L	44.2	49.4	46	42
160	L	38.9	45.9	40	37
200	L	39.3	44.7	41	37
250	L	38.8	44.4	40	37
315	L	36.2	42.9	38	34
400	L	33.9	41.2	35	32
500	L	37.4	43.4	39	35
630	L	35.3	45.4	37	33
800	L	40.3	53.4	43	35
1k	L	40.6	53.6	44	35
1k25	L	41.6	52.9	46	34
1k6	L	42.9	53.8	48	31
2k	L	39.5	50.6	44	29
2k5	L	43.6	56.5	49	27
3k15	L	35.5	46.8	40	27
4k	L	32.6	43.1	37	26
5k	L	31.2	42.2	35	25
6k3	L	28.3	37.5	32	---.-
8k	L	26.6	33.6	30	---.-
10k	L	---.-	30.5	27	---.-
12k5	L	---.-	26.3	---.-	---.-
16k	L	---.-	---.-	---.-	---.-
20k	L	---.-	---.-	---.-	---.-

APPENDIX 3
Sample Survey Results

Position f: Adjacent to car park but further from road. Plant noise

Band (Hz)	Fw	Leq	Lmax	L10	L90
Broadband	L	67.8	78.1	69	66
Broadband	A	47.5	61.4	49	44
12	L	55	64.2	58	49
16	L	56.5	67.8	60	50
20	L	56.9	67.4	60	52
25	L	58.7	67.6	61	54
32	L	57.9	67.7	60	53
40	L	58.1	72.5	61	53
50	L	60	70.5	62	56
63	L	58.7	69.1	61	54
80	L	55.3	63.4	59	50
100	L	50.6	59.4	53	47
125	L	46	57.6	48	42
160	L	41.7	57.9	44	38
200	L	39.7	47.9	43	36
250	L	39	50.7	41	35
315	L	38.1	47.5	40	35
400	L	36	45.2	38	33
500	L	38.3	44.1	40	36
630	L	35.9	43.6	37	34
800	L	37.1	44.6	39	35
1k	L	37.3	42.5	39	35
1k25	L	36.9	49.3	39	34
1k6	L	37.3	51	39	32
2k	L	36.1	53.1	38	29
2k5	L	37.6	56.7	36	26
3k15	L	33.3	54.8	32	---.-
4k	L	27.5	44.7	28	---.-
5k	L	29	49.2	27	---.-
6k3	L	25.7	46.8	---.-	---.-
8k	L	---.-	42.7	---.-	---.-
10k	L	---.-	37.6	---.-	---.-
12k5	L	---.-	32.5	---.-	---.-
16k	L	---.-	27.9	---.-	---.-
20k	L	---.-	25.2	---.-	---.-