

**NOISE ASSESSMENT OF
SITE AT
VALLEY ROAD
WOMBWELL**

An Assessment on Behalf of
Rafahart Ltd

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1. Background

It was proposed that the site of the planned development at Wombwell be assessed so as to determine noise levels with particular reference to the adjacent industrial estate.

The site was originally assessed in August 2005, and a noise report produced. Following comments from Environmental Health at Barnsley Metropolitan Borough Council, additional long term (including night-time) measurements were carried out and a supplemental report produced in January 2006.

The two noise reports showed that while noise from surrounding industrial units should be considered at the detailed planning stage, the levels that could be achieved in both the gardens and noise sensitive rooms of the nearest properties would meet the requirements of the local Environmental Health Department.

Following comments from the Planner questioning some of the conclusions of the noise reports, an indicative site layout was produced and assessed using the long term measurements carried out in January 2006 and further considerations of the data were made in June 2006.

2. Criteria

BS 8233:1999 ('Sound insulation and noise reduction for buildings – Code of practice') gives guidance on acceptable noise levels within dwellings (Table 5 Section 7.6.1.3). The following table shows the internal noise levels it recommends with regard to housing :-

Criterion	Typical Situations	Design range $L_{Aeq,T}$ dB	
		Good	Reasonable

Reasonable resting/sleeping conditions	Living Rooms	30	40
	Bedrooms	30	35

Following discussions with Barnsley Metropolitan District Council Environmental Health Department, it was established that daytime noise levels in gardens should ideally not exceed 55 dB L_{Aeq} (16 hour).

3. Method of Assessment

The site at Wombwell was visited on 17th January 2006 and two long-term noise measurement positions were established on the boundary of the proposed site adjacent to the industrial estate. A 5 minute sampling period was used and 2 four hour observed periods were undertaken (2200 – 0200 and 0600 – 1000 hours). The measurement locations are indicated on the enclosed indicative layout plan in Appendix 1.

4. Noise Measurements

Noise measurements were conducted between 11:30 on Tuesday 17th January and 15:00 on 18th January 2006.

Equipment used: CEL 268 Type 1 Environmental Noise Meter
 Cirrus CR:811B Integrating Averaging Sound Level Type 1 Meter
 CEL 593 Type 1 Sound Level Analyser

Calibration: Field calibration was carried out before and after the noise measures using CEL 284/2 Acoustical Calibrator & a Bruel & Kjaer Type 4230 sound level calibrator.

All equipment used was within UKAS or manufacturer's specification calibration.

Weather: At the time of the noise measures the weather still and mostly dry, with some light drizzle around mid-morning on Wednesday 18th January.

Noise Sources: The site of the proposal is bordered to the west by the Valley Road Industrial Estate, with housing to the other boundaries.

5. Results

The full data set of measured noise values is shown in Appendix 2 of this report and graphs detailing the 5 minute L_{Aeq} values are included in Appendix 3.

The higher levels at the start of the measurements were due to the fixing of chains and padlocks to secure the equipment during the unattended parts of the measurements.

From the periods of observation, the following conclusions were reached:-

- Birdsong was very noticeable in the early morning and daytime period – peak values of over 70 dB(A) were measured at one of the measurement positions.
- Occasional Fork Lift Truck movements within the yard of a window company were evident – typical L_{Aeq} values for these events were observed to be in the order of 55 dB, with L_{AMAX} values ranging from 64 – 71 dB.
- An unidentified fan/compressor/extraction unit – type noise was observed the L_{Aeq} of which varied from between 50 and 60 dB(A)
- Earth works were taking place on the land between the window company and the scaffold company, including the operation of a mini-JCB and a dump truck.
- Noise from the scaffold company was mainly due to poles being moved and a Fork Lift Truck which occasionally moved around the site.
- Typical L_{Aeq} noise levels were in the order of 55 dB during the day and 52 dB during the night.
- Frequency analysis indicated that no single frequency was dominant.

The measurement data included in appendix 2 of this report includes façade reflections from the existing warehouse. As a result a correction to “free field” has been applied to the graphed data in Appendices 3.

6. Discussion

Considering the measured data included in the results it is clear that some noise from the industrial site will be apparent at the proposed residential site. However, inclusion of mitigation measures in the scheme design should provide protection for the gardens and noise sensitive rooms on the west side of the site.

Along the western boundary by Bulling Dike, fencing would need to be installed for safety reasons. If this fencing took the form of a 2 metre close boarded fence, this would have a beneficial impact on the noise climate in the gardens of the properties along this boundary. The measurements showed that typical daytime free field noise levels in the gardens along this boundary were of the order of 52 to 56 dB L_{Aeq} . If a 2 metre high close boarded fence is erected along the site boundary, these levels could reasonably be expected to drop to around 44 to 48 dB L_{Aeq} (barrier attenuation of 8 dB).

In the noise sensitive rooms of properties along the western boundary of the site, internal levels would meet the good standard of BS 8233:1999 (30 dB L_{Aeq}) if windows that give an R_w of in excess of 30 dB were fitted. However a "belt and braces" approach of using windows with a better performance might be more prudent. Appendix 4 of this report lists the acoustic attenuation values given by different glazing combinations. Attention would also need to be given to providing an alternative method of ventilation to opening the windows. This could include acoustically attenuated ventilators or a whole house system.

The properties along the Bulling Dike boundary of the site would shield properties to the east of the site from the industrial noise, so no specific mitigation measures would be needed to create a good noise climate in either the gardens or the noise sensitive rooms.

Appendix 5 includes a more detailed breakdown of the acoustic calculations .

7. Conclusions

Whilst there clearly are external noise sources affecting the site at Wombwell, the mitigation measures detailed above would mean that the influence of these noise sources would be minimised to an extent that they were not intrusive.

8. Recommendations.

It is recommended that :

- a 2 metre barrier fence is erected along the west boundary of the proposed site opposite the industrial site.
- windows of noise sensitive rooms on the western side of the site should be fitted with upgraded sealed units of a 6/12/6mm specification.
- an alternative system of ventilation to opening the windows of noise sensitive rooms should be used.

Appendix 2a
Measurement Data Point A

Location	Point A	
Start	17/01/06	11:30
End	18/01/06	15:15
Period	5 mins	

Date	Start	Leq	Lmax
170106	11:30:00	63.7	81.8
170106	11:35:00	58.8	71.2
170106	11:40:00	55.4	63.9
170106	11:45:00	59.0	79.7
170106	11:50:00	56.4	72.7
170106	11:55:00	56.6	64.7
170106	12:00:00	57.2	73.2
170106	12:05:00	58.8	74.1
170106	12:10:00	56.3	65.1
170106	12:15:00	55.5	65.6
170106	12:20:00	57.0	66.6
170106	12:25:00	55.7	64.8
170106	12:30:00	57.0	70.8
170106	12:35:00	53.2	58.4
170106	12:40:00	53.7	57.7
170106	12:45:00	56.9	66.5
170106	12:50:00	55.6	67.1
170106	12:55:00	55.3	65.1
170106	13:00:00	58.0	68.3
170106	13:05:00	57.4	69.7
170106	13:10:00	58.7	75.9
170106	13:15:00	53.9	62.8
170106	13:20:00	53.0	62.2
170106	13:25:00	50.4	59.4
170106	13:30:00	49.0	58.6
170106	13:35:00	49.6	55.8
170106	13:40:00	52.7	63.1
170106	13:45:00	53.4	69.0
170106	13:50:00	48.0	54.5
170106	13:55:00	47.8	53.4
170106	14:00:00	50.7	60.3
170106	14:05:00	53.1	62.7
170106	14:10:00	57.2	71.3
170106	14:15:00	55.3	65.1
170106	14:20:00	56.0	64.7
170106	14:25:00	54.6	62.6
170106	14:30:00	55.8	65.2
170106	14:35:00	56.4	65.0
170106	14:40:00	55.2	66.3

170106	14:45:00	54.4	65.8
170106	14:50:00	56.0	70.4
170106	14:55:00	55.9	65.9
170106	15:00:00	56.1	71.0
170106	15:05:00	56.3	69.7
170106	15:10:00	54.0	60.1
170106	15:15:00	59.5	69.4
170106	15:20:00	59.1	71.4
170106	15:25:00	56.4	65.5
170106	15:30:00	58.3	70.6
170106	15:35:00	56.5	67.2
170106	15:40:00	56.2	65.2
170106	15:45:00	55.3	65.3
170106	15:50:00	57.3	71.4
170106	15:55:00	59.7	77.0
170106	16:00:00	55.6	63.2
170106	16:05:00	55.3	63.5
170106	16:10:00	55.7	64.3
170106	16:15:00	54.1	68.6
170106	16:20:00	56.0	64.9
170106	16:25:00	56.3	64.1
170106	16:30:00	56.1	65.6
170106	16:35:00	57.0	66.2
170106	16:40:00	58.7	71.5
170106	16:45:00	58.5	75.3
170106	16:50:00	56.5	67.5
170106	16:55:00	55.0	62.6
170106	17:00:00	55.2	61.7
170106	17:05:00	55.5	66.7
170106	17:10:00	56.6	74.9
170106	17:15:00	53.1	58.6
170106	17:20:00	54.1	65.4
170106	17:25:00	55.0	64.5
170106	17:30:00	53.8	59.4
170106	17:35:00	54.1	66.2
170106	17:40:00	55.1	66.6
170106	17:45:00	50.5	62.2
170106	17:50:00	52.4	57.9
170106	17:55:00	55.6	70.4
170106	18:00:00	51.7	61.0
170106	18:05:00	48.3	52.9
170106	18:10:00	47.7	51.1
170106	18:15:00	47.5	51.1
170106	18:20:00	47.3	50.6
170106	18:25:00	50.7	69.5
170106	18:30:00	46.9	57.5

170106	22:25:00	54.7	73.0
170106	22:30:00	54.5	64.7
170106	22:35:00	52.6	57.6
170106	22:40:00	52.3	59.3
170106	22:45:00	47.1	51.7
170106	22:50:00	53.5	66.7
170106	22:55:00	48.5	57.7
170106	23:00:00	50.4	66.3
170106	23:05:00	52.1	58.7
170106	23:10:00	54.9	67.2
170106	23:15:00	52.0	58.1
170106	23:20:00	53.3	60.3
170106	23:25:00	53.0	57.3
170106	23:30:00	53.9	65.0
170106	23:35:00	47.1	50.3
170106	23:40:00	50.7	56.7
170106	23:45:00	49.4	58.2
170106	23:50:00	56.8	68.1
170106	23:55:00	54.0	70.7
180106	00:00:00	53.0	66.9
180106	00:05:00	53.7	66.5
180106	00:10:00	51.4	57.5
180106	00:15:00	52.5	57.8
180106	00:20:00	51.1	56.6
180106	00:25:00	54.9	66.8
180106	00:30:00	50.1	67.1
180106	00:35:00	51.6	57.2
180106	00:40:00	53.8	68.0
180106	00:45:00	55.4	74.2
180106	00:50:00	52.9	58.6
180106	00:55:00	54.4	59.9
180106	01:00:00	53.0	57.0
180106	01:05:00	49.2	54.1
180106	01:10:00	51.1	55.8
180106	01:15:00	51.8	56.3
180106	01:20:00	53.2	56.3
180106	01:25:00	55.2	69.6
180106	01:30:00	52.2	57.0
180106	01:35:00	51.6	57.1
180106	01:40:00	52.4	73.4
180106	01:45:00	49.9	61.9
180106	01:50:00	39.5	50.9
180106	01:55:00	40.3	50.7
180106	02:00:00	36.0	40.4
180106	02:05:00	40.0	54.7
180106	02:10:00	42.7	56.1

180106	02:15:00	43.9	51.2
180106	02:20:00	37.5	46.0
180106	02:25:00	41.2	52.5
180106	02:30:00	37.9	42.9
180106	02:35:00	37.0	41.2
180106	02:40:00	46.3	50.1
180106	02:45:00	47.2	57.8
180106	02:50:00	46.1	50.2
180106	02:55:00	52.3	61.0
180106	03:00:00	54.9	64.4
180106	03:05:00	54.4	65.9
180106	03:10:00	56.5	71.4
180106	03:15:00	52.7	60.1
180106	03:20:00	51.9	58.9
180106	03:25:00	50.7	63.5
180106	03:30:00	45.8	48.8
180106	03:35:00	51.8	56.2
180106	03:40:00	51.7	56.1
180106	03:45:00	54.2	76.7
180106	03:50:00	41.3	50.4
180106	03:55:00	48.8	59.6
180106	04:00:00	50.5	63.2
180106	04:05:00	50.7	63.6
180106	04:10:00	51.7	63.1
180106	04:15:00	54.1	62.0
180106	04:20:00	41.3	49.6
180106	04:25:00	40.4	52.3
180106	04:30:00	46.8	50.6
180106	04:35:00	51.5	57.1
180106	04:40:00	52.0	57.3
180106	04:45:00	53.8	72.9
180106	04:50:00	50.4	58.5
180106	04:55:00	53.3	58.9
180106	05:00:00	50.4	56.9
180106	05:05:00	44.3	50.5
180106	05:10:00	42.8	54.3
180106	05:15:00	42.9	51.6
180106	05:20:00	42.5	50.5
180106	05:25:00	44.1	55.1
180106	05:30:00	47.7	54.3
180106	05:35:00	51.7	69.8
180106	05:40:00	45.1	52.3
180106	05:45:00	44.4	50.7
180106	05:50:00	44.8	55.9
180106	05:55:00	43.3	47.3
180106	06:00:00	43.3	49.1

180106	06:05:00	46.2	59.5
180106	06:10:00	49.3	51.3
180106	06:15:00	53.7	66.2
180106	06:20:00	55.9	71.2
180106	06:25:00	50.3	64.7
180106	06:30:00	47.7	63.1
180106	06:35:00	45.7	52.9
180106	06:40:00	46.4	52.2
180106	06:45:00	47.1	53.5
180106	06:50:00	50.7	70.2
180106	06:55:00	60.1	74.8
180106	07:00:00	53.7	65.4
180106	07:05:00	54.0	67.2
180106	07:10:00	54.9	67.3
180106	07:15:00	55.0	73.0
180106	07:20:00	61.4	74.6
180106	07:25:00	62.3	76.2
180106	07:30:00	56.2	63.7
180106	07:35:00	54.8	65.4
180106	07:40:00	58.7	79.4
180106	07:45:00	54.9	69.7
180106	07:50:00	50.2	57.9
180106	07:55:00	52.4	68.9
180106	08:00:00	51.9	59.6
180106	08:05:00	55.4	67.6
180106	08:10:00	57.2	72.2
180106	08:15:00	56.3	60.4
180106	08:20:00	58.4	69.4
180106	08:25:00	57.5	68.9
180106	08:30:00	57.6	75.2
180106	08:35:00	56.7	68.5
180106	08:40:00	54.2	61.8
180106	08:45:00	57.5	74.5
180106	08:50:00	59.1	72.2
180106	08:55:00	56.7	71.6
180106	09:00:00	53.8	70.8
180106	09:05:00	55.7	69.1
180106	09:10:00	56.4	64.5
180106	09:15:00	56.1	63.4
180106	09:20:00	59.0	77.5
180106	09:25:00	53.2	61.2
180106	09:30:00	51.7	63.3
180106	09:35:00	51.4	64.6
180106	09:40:00	55.3	73.5
180106	09:45:00	54.2	67.7
180106	09:50:00	55.0	70.5

180106	09:55:00	56.8	69.1
180106	10:00:00	51.7	66.1
180106	10:05:00	54.4	65.8
180106	10:10:00	56.1	66.4
180106	10:15:00	54.2	65.0
180106	10:20:00	54.9	65.2
180106	10:25:00	54.4	63.7
180106	10:30:00	53.3	62.7
180106	10:35:00	50.9	58.8
180106	10:40:00	53.9	63.8
180106	10:45:00	57.2	75.6
180106	10:50:00	57.2	70.4
180106	10:55:00	57.1	76.8
180106	11:00:00	49.9	60.2
180106	11:05:00	50.4	56.1
180106	11:10:00	53.9	66.6
180106	11:15:00	50.9	61.4
180106	11:20:00	54.8	67.0
180106	11:25:00	56.9	69.3
180106	11:30:00	55.2	67.8
180106	11:35:00	54.8	63.8
180106	11:40:00	54.4	63.1
180106	11:45:00	57.2	70.0
180106	11:50:00	55.4	62.9
180106	11:55:00	57.2	75.2
180106	12:00:00	56.0	68.1
180106	12:05:00	54.9	63.6
180106	12:10:00	56.7	70.2
180106	12:15:00	56.8	69.9
180106	12:20:00	56.5	73.0
180106	12:25:00	56.9	70.0
180106	12:30:00	55.2	65.5
180106	12:35:00	56.6	67.8
180106	12:40:00	54.4	64.8
180106	12:45:00	57.8	72.1
180106	12:50:00	53.4	59.2
180106	12:55:00	56.2	73.2
180106	13:00:00	54.6	61.2
180106	13:05:00	53.2	64.4
180106	13:10:00	50.6	57.7
180106	13:15:00	57.7	70.3
180106	13:20:00	53.5	63.5
180106	13:25:00	55.1	66.7
180106	13:30:00	53.1	63.7
180106	13:35:00	53.1	67.3
180106	13:40:00	49.2	56.5

180106	13:45:00	48.7	57.6
180106	13:50:00	47.4	53.2
180106	13:55:00	48.1	51.9
180106	14:00:00	51.3	58.6
180106	14:05:00	48.8	58.4
180106	14:10:00	49.5	57.0
180106	14:15:00	54.5	71.3
180106	14:20:00	53.9	63.0
180106	14:25:00	56.2	71.0
180106	14:30:00	50.4	61.3
180106	14:35:00	51.8	59.0
180106	14:40:00	56.3	68.2
180106	14:45:00	52.0	60.3
180106	14:50:00	54.2	59.8
180106	14:55:00	54.5	67.3
180106	15:00:00	57.3	73.3
180106	15:05:00	59.2	75.7
180106	15:10:00	57.9	62.6

Appendix 2b
Measurement Data Point B

Location	Point B	
Start	17/01/06	11:30
End	18/01/06	15:15
Period	5 mins	

Date	Start	Leq	Lmax
170106	11:30:00	61.0	71.4
170106	11:35:00	62.7	84.3
170106	11:40:00	60.5	72.3
170106	11:45:00	60.4	78.4
170106	11:50:00	60.7	78.3
170106	11:55:00	62.0	73.4
170106	12:00:00	61.8	78.9
170106	12:05:00	60.2	71.1
170106	12:10:00	60.7	71.0
170106	12:15:00	59.5	72.9
170106	12:20:00	61.0	70.3
170106	12:25:00	60.7	71.6
170106	12:30:00	61.3	76.0
170106	12:35:00	57.9	67.0
170106	12:40:00	59.5	68.5
170106	12:45:00	62.5	72.5
170106	12:50:00	60.3	71.2
170106	12:55:00	59.4	74.6
170106	13:00:00	63.6	81.2
170106	13:05:00	61.7	76.6
170106	13:10:00	59.7	68.5
170106	13:15:00	53.9	65.1
170106	13:20:00	50.9	62.2
170106	13:25:00	51.3	66.5
170106	13:30:00	49.8	58.2
170106	13:35:00	51.1	60.8
170106	13:40:00	55.4	71.6
170106	13:45:00	55.0	74.1
170106	13:50:00	48.2	60.2
170106	13:55:00	48.1	59.0
170106	14:00:00	53.8	62.3
170106	14:05:00	57.3	71.5
170106	14:10:00	59.4	70.9
170106	14:15:00	60.9	72.5
170106	14:20:00	60.7	71.9
170106	14:25:00	61.4	76.1
170106	14:30:00	59.9	73.4
170106	14:35:00	61.6	74.1
170106	14:40:00	59.8	69.0

170106	14:45:00	60.8	69.5
170106	14:50:00	60.2	69.2
170106	14:55:00	61.1	69.5
170106	15:00:00	60.1	68.7
170106	15:05:00	60.2	68.7
170106	15:10:00	61.1	78.5
170106	15:15:00	59.1	69.6
170106	15:20:00	62.4	70.2
170106	15:25:00	62.1	80.7
170106	15:30:00	64.3	80.1
170106	15:35:00	61.2	77.3
170106	15:40:00	63.3	72.5
170106	15:45:00	57.7	69.8
170106	15:50:00	61.6	77.9
170106	15:55:00	60.6	69.5
170106	16:00:00	60.6	72.7
170106	16:05:00	59.4	73.3
170106	16:10:00	61.3	72.6
170106	16:15:00	58.3	65.4
170106	16:20:00	60.5	74.5
170106	16:25:00	61.6	68.2
170106	16:30:00	61.2	76.3
170106	16:35:00	61.3	68.4
170106	16:40:00	64.5	84.9
170106	16:45:00	61.6	72.4
170106	16:50:00	61.4	72.8
170106	16:55:00	60.6	69.9
170106	17:00:00	61.3	70.3
170106	17:05:00	60.1	70.7
170106	17:10:00	59.5	66.6
170106	17:15:00	60.4	68.0
170106	17:20:00	58.8	69.9
170106	17:25:00	60.2	69.1
170106	17:30:00	59.1	68.0
170106	17:35:00	59.5	68.0
170106	17:40:00	59.2	67.5
170106	17:45:00	59.7	69.8
170106	17:50:00	54.9	63.2
170106	17:55:00	48.7	61.5
170106	18:00:00	48.3	61.1
170106	18:05:00	47.7	58.7
170106	18:10:00	47.4	53.1
170106	18:15:00	47.3	53.9
170106	18:20:00	47.0	52.9
170106	18:25:00	46.6	58.6
170106	18:30:00	52.7	63.3

170106	18:35:00	59.5	67.4
170106	18:40:00	60.9	67.7
170106	18:45:00	60.8	68.9
170106	18:50:00	61.0	68.8
170106	18:55:00	54.2	65.1
170106	19:00:00	62.8	70.3
170106	19:05:00	61.8	71.0
170106	19:10:00	58.1	65.9
170106	19:15:00	60.2	67.0
170106	19:20:00	61.8	67.9
170106	19:25:00	59.3	67.3
170106	19:30:00	58.8	66.6
170106	19:35:00	58.8	67.6
170106	19:40:00	59.2	66.7
170106	19:45:00	60.2	66.7
170106	19:50:00	60.5	66.7
170106	19:55:00	59.9	65.7
170106	20:00:00	59.8	68.3
170106	20:05:00	60.2	67.7
170106	20:10:00	59.7	73.5
170106	20:15:00	60.0	66.2
170106	20:20:00	62.3	68.2
170106	20:25:00	57.9	63.7
170106	20:30:00	55.2	63.1
170106	20:35:00	61.7	66.3
170106	20:40:00	61.3	67.2
170106	20:45:00	61.0	66.1
170106	20:50:00	60.4	68.0
170106	20:55:00	62.0	68.0
170106	21:00:00	60.7	66.8
170106	21:05:00	61.6	68.5
170106	21:10:00	61.7	69.3
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170106	21:20:00	44.7	59.8
170106	21:25:00	47.0	57.0
170106	21:30:00	46.6	56.8
170106	21:35:00	44.6	53.6
170106	21:40:00	43.0	52.3
170106	21:45:00	45.4	59.3
170106	21:50:00	42.3	52.1
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170106	22:10:00	54.1	68.7
170106	22:15:00	54.2	59.0
170106	22:20:00	54.5	62.5

170106	22:25:00	57.6	65.9
170106	22:30:00	61.1	69.6
170106	22:35:00	60.7	69.5
170106	22:40:00	53.9	58.9
170106	22:45:00	54.1	60.8
170106	22:50:00	53.7	57.6
170106	22:55:00	53.8	63.1
170106	23:00:00	60.1	68.5
170106	23:05:00	62.1	67.4
170106	23:10:00	60.8	68.4
170106	23:15:00	60.4	66.7
170106	23:20:00	60.5	66.4
170106	23:25:00	61.0	66.3
170106	23:30:00	55.8	62.5
170106	23:35:00	58.8	66.6
170106	23:40:00	57.1	63.1
170106	23:45:00	60.4	66.2
170106	23:50:00	55.1	64.4
170106	23:55:00	55.8	66.4
180106	00:00:00	54.4	64.4
180106	00:05:00	59.8	67.5
180106	00:10:00	60.2	67.4
180106	00:15:00	60.0	68.3
180106	00:20:00	62.0	69.2
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180106	00:30:00	59.7	67.4
180106	00:35:00	56.9	68.1
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180106	01:20:00	59.8	69.1
180106	01:25:00	60.7	69.4
180106	01:30:00	59.9	67.1
180106	01:35:00	52.0	68.2
180106	01:40:00	42.9	57.0
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180106	01:50:00	38.9	59.5
180106	01:55:00	38.2	65.6
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180106	02:05:00	38.4	48.1
180106	02:10:00	40.5	53.0

180106	02:15:00	37.2	48.1
180106	02:20:00	41.4	54.8
180106	02:25:00	37.7	46.3
180106	02:30:00	40.4	52.4
180106	02:35:00	52.3	54.9
180106	02:40:00	53.3	56.2
180106	02:45:00	53.7	56.7
180106	02:50:00	59.2	65.0
180106	02:55:00	60.4	65.5
180106	03:00:00	61.2	66.1
180106	03:05:00	61.7	66.6
180106	03:10:00	60.1	66.7
180106	03:15:00	56.7	62.7
180106	03:20:00	53.5	63.0
180106	03:25:00	53.6	56.1
180106	03:30:00	59.5	65.5
180106	03:35:00	59.4	65.4
180106	03:40:00	44.9	67.3
180106	03:45:00	40.9	54.4
180106	03:50:00	40.6	51.1
180106	03:55:00	51.4	55.7
180106	04:00:00	53.7	57.1
180106	04:05:00	59.9	66.6
180106	04:10:00	59.4	67.1
180106	04:15:00	38.8	52.1
180106	04:20:00	47.7	56.9
180106	04:25:00	52.3	56.9
180106	04:30:00	58.2	65.6
180106	04:35:00	59.4	66.2
180106	04:40:00	57.2	64.4
180106	04:45:00	57.7	66.3
180106	04:50:00	59.8	69.7
180106	04:55:00	52.8	59.0
180106	05:00:00	42.8	55.4
180106	05:05:00	39.8	53.1
180106	05:10:00	40.1	46.9
180106	05:15:00	40.7	53.7
180106	05:20:00	41.2	55.4
180106	05:25:00	41.2	55.2
180106	05:30:00	45.4	55.7
180106	05:35:00	43.1	49.8
180106	05:40:00	45.9	70.0
180106	05:45:00	43.1	49.8
180106	05:50:00	42.1	52.0
180106	05:55:00	42.0	55.5
180106	06:00:00	44.8	61.0

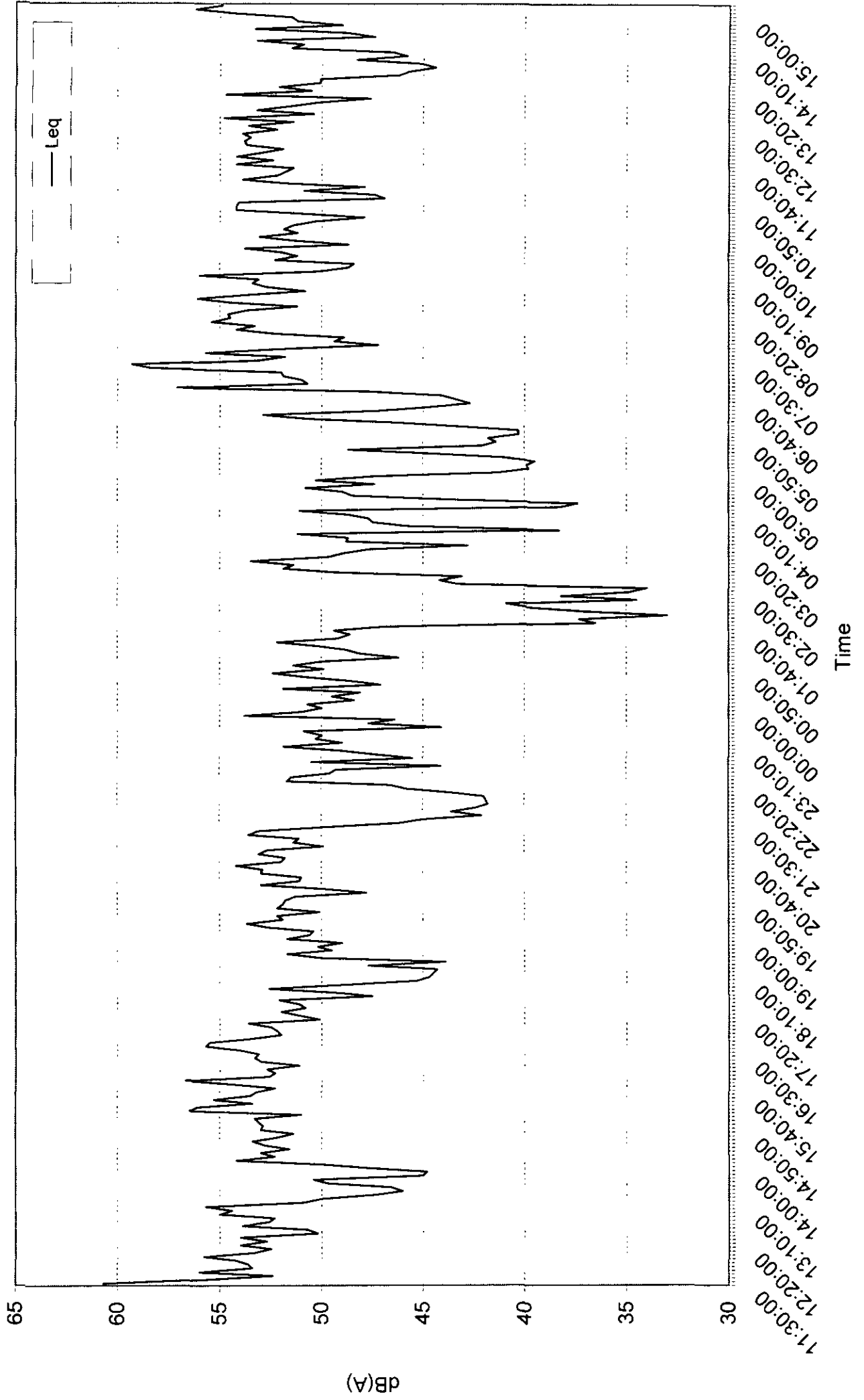
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180106	06:35:00	46.3	53.8
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180106	06:45:00	45.9	52.6
180106	06:50:00	45.7	55.1
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180106	07:05:00	53.5	69.1
180106	07:10:00	55.1	69.4
180106	07:15:00	54.3	69.0
180106	07:20:00	55.9	71.7
180106	07:25:00	55.3	69.4
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180106	07:35:00	51.7	63.1
180106	07:40:00	53.5	67.3
180106	07:45:00	54.4	76.6
180106	07:50:00	57.1	77.8
180106	07:55:00	57.1	73.5
180106	08:00:00	62.4	79.8
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180106	08:10:00	61.9	72.8
180106	08:15:00	62.0	76.1
180106	08:20:00	60.8	73.6
180106	08:25:00	62.8	83.4
180106	08:30:00	57.9	73.0
180106	08:35:00	60.4	71.8
180106	08:40:00	61.3	71.8
180106	08:45:00	60.7	72.6
180106	08:50:00	60.1	69.5
180106	08:55:00	54.0	77.2
180106	09:00:00	57.1	68.6
180106	09:05:00	62.1	72.5
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180106	09:15:00	61.3	71.6
180106	09:20:00	53.9	71.9
180106	09:25:00	54.3	73.5
180106	09:30:00	56.8	80.6
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180106	09:55:00	54.0	72.5
180106	10:00:00	53.5	66.7
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180106	10:40:00	55.9	71.0
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180106	11:15:00	61.3	75.6
180106	11:20:00	56.4	76.7
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180106	11:40:00	61.0	69.9
180106	11:45:00	60.2	70.9
180106	11:50:00	60.0	71.5
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180106	12:00:00	60.0	66.2
180106	12:05:00	55.5	67.0
180106	12:10:00	55.7	74.2
180106	12:15:00	59.4	66.7
180106	12:20:00	55.7	72.4
180106	12:25:00	58.5	71.8
180106	12:30:00	58.2	67.3
180106	12:35:00	57.2	69.7
180106	12:40:00	59.6	71.3
180106	12:45:00	60.2	70.5
180106	12:50:00	58.3	69.8
180106	12:55:00	57.2	72.5
180106	13:00:00	54.2	74.4
180106	13:05:00	62.6	82.3
180106	13:10:00	54.8	72.0
180106	13:15:00	56.8	75.2
180106	13:20:00	54.1	75.1
180106	13:25:00	55.0	80.3
180106	13:30:00	51.6	68.9
180106	13:35:00	51.7	67.8
180106	13:40:00	48.6	58.6

180106	13:45:00	49.0	59.8
180106	13:50:00	53.2	65.0
180106	13:55:00	50.3	62.8
180106	14:00:00	52.7	63.5
180106	14:05:00	55.4	65.0
180106	14:10:00	58.3	81.9
180106	14:15:00	60.9	68.5
180106	14:20:00	56.1	77.4
180106	14:25:00	57.1	71.4
180106	14:30:00	63.1	77.5
180106	14:35:00	56.5	68.6
180106	14:40:00	60.3	69.3
180106	14:45:00	58.1	70.2
180106	14:50:00	61.9	76.6
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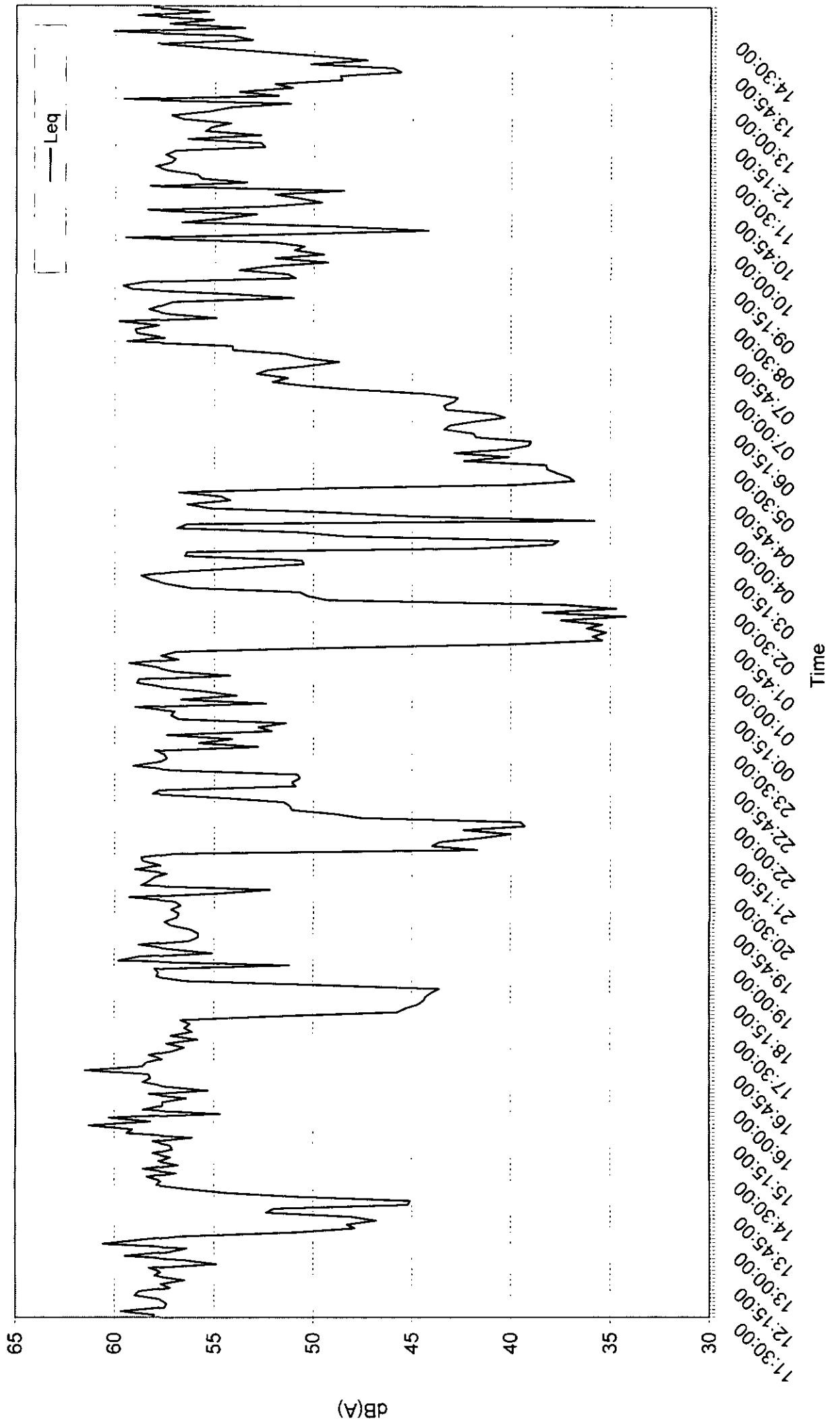
Appendix 3a
Measurement Data Point A – Graph of L_{Aeq} Values

Valley Road Wombwell
Measurement Point A



Appendix 3b
Measurement Data Point B – Graph of L_{Aeq} Values

Valley Road Wombwell
Measurement Point B



Appendix 4
Typical Attenuation Values

TYPICAL SOUND REDUCTION OF GLAZED UNITS

UNIT	Noise Reduction In dB(A) (R_w)*
Single, 4mm glass	30
Sealed unit 4/6/4 (4mm glass/6mm space/4mm glass)	31
Sealed unit 6/12/6	33
Sealed unit 4/12/10	36
Single 6.4 laminated glass	36
Sealed unit 6.4/12/10	40
Sealed unit 10/12/17	45
Double 6/100/4 with lined reveals	46
Double 4/150/4 with lined reveals	47
Double 10/200/6 with lined reveals	49

All values based on published research by Pilkington Glass.

* R_w is the noise reduction index referred to in
Planning Policy Guidance 'Planning and Noise' (PPG 24)

Appendix 5
Calculations

TYPICAL DAYTIME $L_{Aeq}(16 \text{ hour})$ NOISE LEVELS

GARDENS ALONG WESTERN BOUNDARY

	Point A	Point B	Worst Case ¹
Measured façade level	55 dB	59 dB	65 dB
Subtract façade reflection	3 dB	3 dB	3 dB
Subtract barrier correction	8 dB	8 dB	8 dB
Free field garden level	44 dB	48 dB	54 dB

NOISE SENSITIVE ROOMS ALONG WESTERN BOUNDARY

GROUND FLOOR

	Point A	Point B	Worst Case ¹
Measured façade level	55 dB	59 dB	65 dB
Subtract barrier correction	8 dB	8 dB	8 dB
Subtract typical window attenuation ²	33 dB	33 dB	33 dB
Internal noise level	<30 dB	<30 dB	<30 dB

NOISE SENSITIVE ROOMS ALONG WESTERN BOUNDARY

FIRST FLOOR AND ABOVE

	Point A	Point B	Worst Case ¹
Measured façade level	55 dB	59 dB	65 dB
Subtract typical window attenuation ²	33 dB	33 dB	33 dB
Internal noise level	<30 dB	<30 dB	<30 dB

¹ Highest measured $L_{Aeq}(5 \text{ minutes})$ during the daytime.

² Assumes windows are closed with a typical sealed unit specification of 6mm plate glass, 12mm air gap, 6mm plate glass.

TYPICAL NIGHT-TIME $L_{Aeq(8 \text{ hour})}$ NOISE LEVELS

GARDENS ALONG WESTERN BOUNDARY

	Point A	Point B	Worst Case ³
Measured façade level	52 dB	57 dB	62 dB
Subtract façade reflection	3 dB	3 dB	3 dB
Subtract barrier correction	8 dB	8 dB	8 dB
Free field garden level	41 dB	46 dB	51 dB

NOISE SENSITIVE ROOMS ALONG WESTERN BOUNDARY GROUND FLOOR

	Point A	Point B	Worst Case ¹
Measured façade level	52 dB	57 dB	62 dB
Subtract barrier correction	8 dB	8 dB	8 dB
Subtract typical window attenuation ⁴	33 dB	33 dB	33 dB
Internal noise level	<30 dB	<30 dB	<30 dB

NOISE SENSITIVE ROOMS ALONG WESTERN BOUNDARY FIRST FLOOR AND ABOVE

	Point A	Point B	Worst Case ¹
Measured façade level	52 dB	57 dB	62 dB
Subtract typical window attenuation ²	33 dB	33 dB	33 dB
Internal noise level	<30 dB	<30 dB	<30 dB

³ Highest measured L_{Aeq} (5 minutes) during the night-time.

⁴ Assumes windows are closed with a typical sealed unit specification of 6mm plate glass, 12mm air gap, 6mm plate glass.