
Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

Acoustic Report

**Environmental Noise Survey
Site Ref 82 - Whitegate Road
Wrexham, North Wales.**

Our Reference - J1775
Survey Date – 28th / 29th June 2010
Survey and Report by – Paul Horsley MIOA

Date of Report – 29th June 2010

A handwritten signature in black ink, appearing to read 'P. Horsley', with a long horizontal flourish extending to the right.

Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

Contents

- 1.0 Client
- 2.0 Subject
- 3.0 Aims
- 4.0 Guidance on the Assessment of Noise Levels
 - 4.1 BS4142:1997 'Method for Rating Industrial Noise Affecting Mixed residential and Industrial Areas'
 - 4.2 Technical Advice Note 11, TAN 11
 - 4.3 World Health Organization 1999 "Guidance for Community Noise"
- 5.0 Location and Description of Existing Noise Sources
- 6.0 Survey Equipment
- 7.0 Survey Method
- 8.0 Prevailing Weather Conditions
- 9.0 Noise Survey Results
- 10.0 Noise Survey Results Tables 1 and 2
- 11.0 Results Analysis
- 12.0 Assessment Conclusions
- 13.0 Mitigating Circumstances
 - 13.1 Building Fabric Construction
 - 13.2 Glazing Units
 - 13.3 External Recreational Areas
- 14.0 Report Summary

Appendix A – Locational Plan and Survey Position

Appendix B – Noise Survey Frequency Results Tables 1 and 2

Appendix C - Proposed Site Layout drawing 6672/L(9)01 Rev B

Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

1.0 Client

Wrexham County Borough Council
Housing Services
Ruthin Road
Wrexham
LL13 7TH

2.0 Subject

Outline Planning Application for
Erection of 12 No Semi-Detached Residential Dwellings
On Land at Site Ref 82 - Whitegate Road
Wrexham

3.0 Aims

The aim of this report is to determine the existing baseline background noise environment levels, over a typical 24-hour weekday period, affecting the proposed development location in accordance with the requirements of BS4142: 1997 'Method for Rating Industrial Noise affecting Mixed Residential and Industrial areas, in support of the proposed outline planning application for erection of 12 No semi detached 2 and 3 bedroom dwellings.

Provide an assessment of the results in accordance with Technical Advice Note 11, TAN 11, and World Health Organization 1999, Guidance for Community Noise, for the proposed development site.

Provide mitigating noise control advice relating to the achievement of an acceptable internal environment for the development.

4.0 Guidance on the Assessment of Noise Levels

The purpose of any criterion or standard for environmental noise should be to safeguard against unacceptable levels of community response, deemed as a feeling of annoyance during daytime or disturbance at night. WHO defines annoyance as; *"...a feeling of displeasure evoked by noise."*

The main source of information relating to noise and the community response are field studies including noise measurements and social surveys. These studies then attempt to establish a correlation between the two sets of results.

In the absence of any definitive guidance and in order to establish suitable noise criteria, it is necessary to rely on general guidance and assessment methods used for community noise sources. Discussions on the current methods are given below.

4.1 BS4142:1997 'Method for Rating Industrial Noise Affecting Mixed residential and Industrial Areas'

This standard provides a method by which the impact of noise from factories, industrial premises, fixed installations and noise sources of an industrial nature in commercial premises can be predicted in terms of the likelihood of complaints arising from people residing in nearby dwellings. The standard is intended for assessing the measured or calculated noise levels from both existing and new or modified premises.

The likelihood that an individual will complain depends on individual attitudes and perceptions in addition to the noise levels and acoustic features present. The standard however, is only concerned with the rating of a noise based on the margin by which it exceeds a background noise level, with an appropriate allowance for any acoustic characteristics that may be present. In general, a noise is likely to cause complaints when it exceeds the background by a certain margin.

- A difference of around +10 dB or more indicates that complaints are likely
- A difference of around +5 dB is of marginal significance
- If the rating level is more than dB below the measured background noise level then this is a positive indication that complaints are unlikely.

An important cautionary note is included within the standard:

"...the user is reminded that this standard is not based on substantive research but rather on accumulated experience"

It is also states that the method is not suitable for assessing noise measured inside buildings or when the background and rating levels are both very low¹.

1 - For the purposes of the standard, background noise levels below 30 dB and rating levels below say 35 dB are considered to be very low.

4.2 Technical Advice Note (Wales) 11, TAN 11

Technical Advice Note (Wales) 11, TAN 11, gives guidance to local authorities in Wales on the use of their planning powers to minimise the adverse impacts of noise and builds upon the advice contained in '*Planning Guidance(Wales): Planning Policy*', 1996, paragraphs 43-45.

TAN 11 outlines the considerations to be taken into account in determining planning applications both for noise-sensitive developments and for those activities that will generate noise. It introduces important standards and references including BS8233:1987 "*Sound insulation and noise reduction for buildings*", CRTN "*Calculation of road traffic noise*", BS 7445 "*Description and measurement (1Hz to 80 Hz)*"etc.

The concept of noise exposure categories for residential development is also introduced, and recommendations are made regarding appropriate levels of exposure to different sources of noise. However, Annex 1 of the TAN it is stated that:

"The NEC procedure is only applicable where consideration is being given to introducing residential development in an area with an existing noise source, but not the reverse situation where new sources are to be introduced into an existing residential area."

Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

The reason given in the TAN is as follows:

"This is because the planning system can be used to impose conditions to protect incoming residential development from an existing noise source but, in general, developers are under no statutory obligation to offer noise protection measures to existing dwellings which will be affected by a proposed new noise source."

The four NECs are defined thus:

NEC	
A	Noise need not be considered as a determining factor in granting planning permission, although the level at the end of the category should not be regarded as a desirable level.
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.
C	Planning permission should not normally be granted. Where it is considered that permission should be given, for example because there are no alternative quieter sites available, conditions should be imposed to ensure a commensurate level of protection against noise.
D	Planning permission should normally be refused.

The noise levels corresponding to the NECs for road, rail, air and mixed noise sources are given below.

Values in the table refer to noise levels measured on an open site at the position of the proposed dwellings, well away from any existing buildings, and 1.2m to 1.5m above the ground.

Recommended Noise Exposure Categories for New Dwellings near Existing Sources

Noise Level Corresponding to Noise Exposure Categories for New Dwellings, LAeq,T (dB)				
	Noise Exposure Categories			
Noise Source	A	B	C	D
Road Traffic				
07.00 – 23.00	<55	55 – 63	63 – 72	>72
23.00 – 07.00	<45	45 – 57	57 – 66	>66
Rail Traffic				
07.00 – 23.00	<55	55 – 66	66 – 74	>74
23.00 – 07.00	<45	45 – 59	59 – 66	>66
Air Traffic				
07.00 – 23.00	<57	57 – 66	63 – 72	>72
23.00 – 07.00	<48	48 – 57	57 – 66	>66
Mixed Sources				
07.00 – 23.00	<55	55 – 63	63 – 72	>72
23.00 – 07.00	<45	45 – 57	57 – 66	>66

Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

The TAN also provides general advice on the approach that may be used to limit the impact of noise i.e.:

- (i) **Engineering:** reduction of noise at point of generation (e.g. by using quiet machines and/or quiet methods of working); containment of noise generated (e.g. by insulating buildings which house machinery and/or providing purpose-built barriers around the site); and protection of surrounding noise-sensitive buildings (e.g. by improving sound insulation in these buildings and/or screening them by purpose built barriers);
- (ii) **Lay-out:** adequate distance between source and noise sensitive building or area; screening by natural barriers, other buildings, or non-critical rooms in a building;
- (iii) **Administrative:** limiting operating time of source; restricting activities allowed on the site; specifying an acceptable noise limit.

The glossary of the TAN contains definitions of various acoustic terms and states that a change of 3 dB(A) is the minimum perceptible under normal conditions.

4.3 World Health Organization 1999 *"Guidance for Community Noise"*

This document provides a review of the effects of noise and a description of the principles of the WHO health criteria and guidelines for Community Noise.

The effects of noise in dwellings are identified as sleep disturbance, annoyance and speech interference. For bedrooms, the critical effect is sleep disturbance. Indoor guideline values for bedrooms are 30 dB LAeq for continuous noise and 45 dB LMax for sound events. At night time, outside sound levels about 1 metre from facades of living spaces should not exceed 45 dB LAeq, so that people may sleep with bedroom windows open. This value is equivalent to that specifies in the Criteria 12 document; however it is now assumed that the noise reduction from outside to inside with the window open is 15 dB.

To enable casual conversation indoors during the daytime, the sound level of the interfering noise should not exceed 35 dB LAeq.

To protect the majority of people from being **seriously** annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55dB LAeq on balconies,

Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

terraces and in outdoor living areas. To protect the majority of people from being **moderately** annoyed during the daytime, the outdoor sound level should not exceed 50 dB LAeq.

Table 1 of the document summarises the guideline values for community noise in specific environments and includes the noise indices to be adopted. Significantly, the corresponding time base to be used for the assessment is also included.

The relevant extracts of Table 1 are reproduced thus:

Specific Environment	Critical health effect (s)	LAeq dB	Time Base hours	LAMax dB
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate Annoyance, Daytime and evening	50	16	-
Dwelling, Indoors	Speech intelligibility & moderate annoyance daytime & evening.	35	16	-
	Sleep Disturbance, night-time	30	8	45
Outside Bedroom	Sleep disturbance, window open (Outdoor Values)	45	8	60

5.0 Location and Description of Existing Noise Sources

The proposed development site is positioned off Whitegate Road, Wrexham and consists of a carpark facility used by the Whitegate Industrial Estate personnel and Wrexham CBC transport vehicles.

The site occupies an area approximately 100m x 30m which is primarily rectangular in shape. It is situated north of the slip road leading to an industrial estate accessed off Whitegate Road.

The northern site boundary is formed by a residential link road from Whitegate Road leading to Queensway, with residential semi-detached housing located beyond. There is a further car park south of the site, on the opposite side of the industrial estate slip road, with an open green space with football pitch area beyond.

The eastern site boundary is formed by Whitegate Industrial Estate, with the gate house and access gates located to the south eastern corner of the site. Access to and from the industrial estate is off Westgate Road along the slip road in front of the site.

The primary noise sources within the vicinity of the site are predominantly due to traffic noise along the local road network and accessing the industrial estate. There is also very extremely low plant and equipment noise and activities audible from the neighbouring industrial units located nearby on the industrial estate. Birdsong is also a significant noise source during all periods, especially the evening and early mornings

It is the noise from these sources that are under consideration within this report.

Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

6.0 Survey Equipment

Real-Time 1/3 Octave Integrating Sound Level Meter, RION NA-27, Type 1, Serial No 431986.

RION UC-53A Microphone Serial No 35771.

RION NC-74 Calibrator Serial No 530712.

Windshield.

Tripod.

7.0 Survey Method

An attended environmental noise assessment survey was carried out over a typical 24-hour week day period. The noise monitoring was executed between 28th and 29th June 2010, by the author.

LA_{eq} , LA_{90} , LA_{10} , LA_{max} and LA_{min} sound measurements were taken using the sound analyser. The meter was calibrated before and after the measurements using the calibrator to ensure accuracy of the results. No variations were noted between calibrations and the results obtained can be deemed to be an accurate representation of the levels recorded.

The measurement indices noted above are defined as follows:

LA_{eq}, T	the "A" weighted equivalent continuous noise level of sample period T
LA_{10}, T	the "A" weighted level exceeded for 10% of sample period T
LA_{90}, T	the "A" weighted level exceeded for 90% of sample period T
LA_{max}	The "A" weighted maximum level during the sample period T
LA_{min}	The "A" weighted minimum level during the sample period T

The sound level meter was calibrated before and after the measurements using the calibrator to ensure accuracy of the results. No variations were noted between calibrations and the results obtained can be deemed to be an accurate representation of the levels recorded.

In order to determine the existing baseline background noise climate, sound recordings were taken over 15-minute periods within any one hour period, at each of the selected assessment positions in accordance with BS4142:1997.

Refer to Appendix A for a marked up locational plan of the store and survey points.

Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

8.0 Prevailing Weather Conditions

28th June 2010 – Morning – 24°C, Clear Sky, Wind speed approx 0-2 mph.

28th June 2010 – Afternoon - 26°C, Variable Sky, Wind speed approx 0-3 mph.

28th June 2010 – Evening – 24°C, Overcast Sky, Wind speed approx 0-2 mph.

28th / 29th June 2010 – Nighttime - 19°C, Overcast Sky, Wind speed approx 2-5 mph.

29th June 2010 – Early Morning – 18°C, Clear Sky, Wind speed approx 1-3 mph.

9.0 Noise Survey Results

During the monitoring period 48 separate noise samples were recorded using a 1/1 Octave Centre Band analysis. These monitoring samples were collected from the eastern and western site boundaries. This was to establish the general noise levels experienced by the site at the most exposed positions to the potential noise sources and therefore likely to experience the worst case noise climate.

The table of results on the following pages indicate the noise levels recorded during the monitoring period, with a TAN 11 Rating for the reading.

Note

The above monitoring location should be read in conjunction with the site plan appearing in Appendix A of this report.

Refer to Appendix B for the survey results frequency analysis table.

Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

10.0 Noise Survey Results Table 1 of 2

PROPOSED WHITEGATE ROAD SITE - NOISE SURVEY RESULTS TABLE

Map Location	Survey Period	Description of Location	Data ID	L _{Amax} dB	L _{Amin} dB	L _{Aeq} dB	L _{A10} dB	L _{A90} dB	Survey Duration	Survey Date	Start Time	Source Description	TAN 11 Category
1	10.00 - 11.00	East site boundary location 2m from boundary fence.	1	72.7	38.1	50.5	53.2	41.5	00:15:00.00	28-06-2010	10:04:04	Traffic dominant source. Birdsong.	A
1	11.00 - 12.00		3	61.9	38.9	45.9	48.2	42.1	00:15:00.00	28-06-2010	11:00:44	Traffic dominant source. Birdsong. Resident cutting lawn.	A
1	12.00 - 13.00		5	63.8	39.8	48.3	51.0	43.6	00:15:00.00	28-06-2010	12:24:59	Traffic dominant source. Birdsong. Aircraft.	A
1	13.00 - 14.00		7	62.6	40.3	48.2	50.9	43.1	00:15:00.00	28-06-2010	13:00:41	Traffic dominant source. Birdsong. Aircraft.	A
1	14.00 - 15.00		9	74.0	39.2	48.7	50.1	42.7	00:15:00.00	28-06-2010	14:04:09	Traffic dominant source. Birdsong. Roadworks noise in distance.	A
1	15.00 - 16.00		11	57.2	41.7	49.4	52.3	44.3	00:15:00.00	28-06-2010	15:04:02	Birdsong Dominant. Low distant traffic noise.	A
1	16.00 - 17.00		13	73.7	41.3	54.2	56.8	45.2	00:15:00.00	28-06-2010	16:17:46	Traffic noise leaving industrial estate past site dominant for 3 minutes only.	A
1	17.00 - 18.00		15	73.2	43.1	54.0	55.7	46.9	00:15:00.00	28-06-2010	17:05:30	Traffic noise leaving industrial estate past site dominant for approx 2 minutes only.	A
1	18.00 - 19.00		17	54.6	39.0	44.3	46.9	40.5	00:15:00.00	28-06-2010	18:19:39	Birdsong Dominant. Low distant traffic noise.	A
1	19.00 - 20.00		19	62.7	40.0	48.6	50.9	43.8	00:15:00.00	28-06-2010	19:04:10	Birdsong Dominant. Low distant traffic noise.	A
1	20.00 - 21.00		21	62.0	34.7	46.0	49.2	37.1	00:15:00.00	28-06-2010	20:02:24	Low distant traffic noise. Dog barking.	A
1	21.00 - 22.00		23	63.1	34.8	42.0	44.8	36.4	00:15:00.00	28-06-2010	21:13:10	Low distant traffic noise only.	A
1	22.00 - 23.00		25	42.2	35.2	38.3	40.6	36.5	00:15:00.00	28-06-2010	22:07:03	Low distant traffic noise only.	A
1	23.00 - 00.00		27	49.9	34.0	38.5	40.4	35.0	00:15:00.00	28-06-2010	23:04:18	Low distant traffic noise. Trees rustling in breeze.	A
1	00.00 - 01.00		29	41.2	36.2	38.0	38.8	37.1	00:15:00.00	29-06-2010	00:09:17	Low distant traffic noise only.	A
1	01.00 - 02.00		31	38.8	35.5	37.0	38.1	36.2	00:15:00.00	29-06-2010	01:09:03	Low distant traffic noise only.	A
1	02.00 - 03.00		33	47.0	32.2	35.8	37.1	33.3	00:15:00.00	29-06-2010	02:02:28	Low distant traffic noise only.	A
1	03.00 - 04.00		35	41.0	32.1	35.0	37.1	33.2	00:15:00.00	29-06-2010	03:09:19	No discernible noise source.	A
1	04.00 - 05.00		37	44.5	35.5	39.1	41.0	37.1	00:15:00.00	29-06-2010	04:05:43	Birdsong Dominant. Low distant traffic noise.	A
1	05.00 - 06.00		39	52.5	36.7	41.7	44.0	38.7	00:15:00.00	29-06-2010	05:12:13	Birdsong Dominant. Low distant traffic noise.	A
1	06.00 - 07.00		41	61.4	38.5	49.1	52.8	41.4	00:15:00.00	29-06-2010	06:06:05	Birdsong Dominant. Low distant traffic noise.	B
1	07.00 - 08.00		43	65.3	38.3	49.5	52.2	42.2	00:15:00.00	29-06-2010	07:05:14	Birdsong Dominant. Low local and distant traffic noise.	A
1	08.00 - 09.00		45	73.9	42.4	53.1	55.1	46.2	00:15:00.00	29-06-2010	08:22:02	Traffic dominant source local onto industrial estate. Birdsong. Aircraft.	A
1	09.00 - 10.00		47	71.5	40.8	50.9	53.5	45.4	00:15:00.00	29-06-2010	09:11:05	Traffic dominant source. Birdsong.	A

Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

10.0 Noise Survey Results Table 2 of 2

PROPOSED WHITEGATE ROAD SITE - NOISE SURVEY RESULTS TABLE

Map Location	Survey Period	Description of Location	Data ID	L _{max} dB	L _{min} dB	L _{Aeq} dB	LA10 dB	LA90 dB	Survey Duration	Survey Date	Start Time	Source Description	TAN 11 Category
2	10.00 - 11.00	West site boundary location 3m from boundary hedge.	2	64.1	38.9	47.8	51.1	41.7	00:15:00.00	28-06-2010	10:39:19	Traffic dominant source. Birdsong. Aircraft.	A
2	11.00 - 12.00		4	63.2	40.2	50.6	53.7	44.5	00:15:00.00	28-06-2010	11:22:49	Traffic dominant source. Birdsong. Aircraft. Roadworks noise in distance.	A
2	12.00 - 13.00		6	72.4	39.9	47.8	49.9	43.3	00:15:00.00	28-06-2010	12:41:38	Traffic dominant source. Birdsong.	A
2	13.00 - 14.00		8	72.6	38.9	48.9	51.2	43.2	00:15:00.00	28-06-2010	13:18:56	Traffic dominant source. Birdsong. Trees rustling in breeze.	A
2	14.00 - 15.00		10	65.4	39.0	47.3	50.0	43.2	00:15:00.00	28-06-2010	14:22:05	Traffic dominant source. Birdsong. Roadworks noise in distance.	A
2	15.00 - 16.00		12	71.3	42.4	48.7	49.9	44.3	00:15:00.00	28-06-2010	15:27:34	Birdsong Dominant. Low distant and local traffic noise.	A
2	16.00 - 17.00		14	68.3	39.9	52.5	55.6	42.5	00:15:00.00	28-06-2010	16:40:32	Birdsong Dominant. Low distant and local traffic noise.	A
2	17.00 - 18.00		16	70.9	40.3	54.1	57.6	45.0	00:15:00.00	28-06-2010	17:23:21	Birdsong Dominant. Low distant and local traffic noise. Aircraft.	A
2	18.00 - 19.00		18	69.6	40.7	50.1	50.2	43.2	00:15:00.00	28-06-2010	18:41:47	Birdsong Dominant. Low distant traffic noise.	A
2	19.00 - 20.00		20	61.2	41.4	48.6	51.0	45.3	00:15:00.00	28-06-2010	19:24:53	Birdsong Dominant. Low distant traffic noise.	A
2	20.00 - 21.00		22	64.9	33.1	43.2	46.4	36.0	00:15:00.00	28-06-2010	20:24:10	Low distant and local traffic noise.	A
2	21.00 - 22.00		24	53.9	33.5	40.3	43.4	36.1	00:15:00.00	28-06-2010	21:35:09	Low distant traffic noise only.	A
2	22.00 - 23.00		26	52.2	34.2	42.1	44.6	35.9	00:15:00.00	28-06-2010	22:27:48	Low distant traffic noise only.	A
2	23.00 - 00.00		28	42.8	33.7	36.5	38.2	34.6	00:15:00.00	28-06-2010	23:23:09	Low distant traffic noise. Trees rustling in breeze.	A
2	00.00 - 01.00		30	47.0	35.5	38.5	40.3	36.8	00:15:00.00	29-06-2010	00:33:03	Low distant traffic noise. Aircraft.	A
2	01.00 - 02.00		32	43.9	36.5	39.0	40.3	37.8	00:15:00.00	29-06-2010	01:35:03	Low distant traffic noise only.	A
2	02.00 - 03.00		34	42.0	29.5	33.2	34.9	30.8	00:15:00.00	29-06-2010	02:27:16	Low distant traffic noise only.	A
2	03.00 - 04.00		36	48.1	31.7	33.9	34.7	32.5	00:15:00.00	29-06-2010	03:29:06	No discernible noise source.	A
2	04.00 - 05.00		38	48.8	37.5	40.2	41.9	38.6	00:15:00.00	29-06-2010	04:23:11	Birdsong Dominant. Low distant traffic noise.	A
2	05.00 - 06.00		40	64.5	38.5	48.4	51.3	41.1	00:15:00.00	29-06-2010	05:33:06	Birdsong Dominant. Low distant traffic noise.	B
2	06.00 - 07.00		42	59.6	41.4	46.4	49.5	43.6	00:15:00.00	29-06-2010	06:27:21	Birdsong Dominant. Low distant traffic noise.	B
2	07.00 - 08.00		44	67.3	38.3	50.1	52.5	43.0	00:15:00.00	29-06-2010	07:24:05	Birdsong Dominant. Low local and distant traffic noise.	A
2	08.00 - 09.00		46	76.0	44.3	54.4	56.0	48.6	00:15:00.00	29-06-2010	08:41:10	Traffic dominant source local onto industrial estate. Birdsong. 2 No Aircraft.	A
2	09.00 - 10.00		48	67.0	40.7	49.5	51.4	43.3	00:15:00.00	29-06-2010	09:29:34	Traffic dominant source. Birdsong.	A

Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

11.0 Results Analysis

The above attended noise survey, carried out between Monday 28th and Tuesday 29th June 2010, was chosen as a representative weekday period to reflect the typical noise climate for the area surrounding the proposed residential site.

The noise survey results obtained for the site can, therefore, be deemed to be representative of normal activities for the area and will be used as the base for analysis and assessment purposes below.

Assessments of the individual results are included with a Technical Advise Note (Wales) 11, TAN 11, noise exposure category, NEC, rating from A to C, for the survey location.

The TAN 11 Rating is used by the local authorities in Wales to assess the proposal for residential developments close to existing noise sources with view to granting planning permission. This is a useful guideline in assessing the exposure of a site.

12.0 Assessment Conclusions

The noise sources are predominantly due to traffic noise, with significant contributions from birdsong, however, birdsong is classified as a natural source and does not fall within any of the categorizations below, and as such the assessment categories used are the "Traffic Source" rating levels within TAN 11.

As can be seen from the results table above, the site was experiencing a rating of **Category A through to B**. This was due mainly to the traffic flow along the local network and along the slip road to the industrial estate, providing an intermitant background noise climate, audible at the site location. The Category B situations were being produced by the loud birdsong in the area and as such should not be considered detrimental to the area noise climate.

The result for the site, without the birdsong noise, is a Category A noise climate; taking account of this result local planning authorities would take consideration of TAN 11 the requirements of which state:

Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

"Noise need not be considered as a determining factor in granting planning permission, although the level at the end of the category should not be regarded as a desirable level."

In order to verify this statement and meet the guidelines for this site we must first establish the 16-Hour daytime and 8-hour nighttime LAeq dB exposure levels, with the LAmax figure for nighttime periods. For robustness the birdsong influence has been included within the finalized LAeq, 16hour and LAeq 8hour values.

From the data acquired during the 24-hour assessment period the following single figure exposure levels have been established for the site.

Table of Site Exposure Levels

Location 1 - Period	Noise Level	TAN 11 Category NEC
Daytime (0700 – 2300 Hrs)	LAeq, 16 Hours – 49 dB	A
Night-time (2300 – 0700 Hrs)	LAeq, 8 Hours – 42 dB LAmax - 61 dB *	A
Location 2 - Period	Noise Level	TAN 11 Category NEC
Daytime (0700 – 2300 Hrs)	LAeq, 16 Hours – 49 dB	A
Night-time (2300 – 0700 Hrs)	LAeq, 8 Hours – 43 dB LAmax - 64 dB *	A

* Due to birdsong during dawn chorus.

13.0 Mitigating Circumstances

The outline planning application is for the existing Wrexham CBC carpark area, site reference 82, to be replaced with the development of 12 No residential semi-detached dwellings with 24 car parking spaces within a courtyard to the south of the site adjacent to the existing slip road access to the industrial estate. Each property within the development will have an individual recreational garden on the northern side of the houses, with a footpath along the front of the houses to the south and no garden to this elevation. Refer to Proposed Site Layout drawing 6672/L(9)01 Rev B, appearing in appendix C for graphic details.

It is assumed that the building envelope will be constructed to the latest Building Regulations, and be of a robust construction to provide adequate attenuation against the external noise sources, identified in the vicinity, to achieve comfortable internal noise levels. The details of the building envelope have yet to be determined and further guidance can be provided once finalised.

There are 3 main areas to consider within the development to ensure that the buildings are providing adequate attenuation against the ingress of external noise sources that are likely to affect the comfort and amenity of the residents.

- Building Fabric Construction
- Glazing Units
- External Recreational Areas

13.1 Building Fabric Construction

The Building Regulation, relating to the minimum acoustic requirements for the various areas of the development, must be met. Again, the finalized details of the construction methods for the proposed dwellings have yet to be made.

Actual verification of the acoustic properties of the buildings fabric will need to be executed by pre-completion sound testing prior to occupation, or through certified test data with a Robust Details construction method.

Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

Based upon the external baseline noise levels recorded, primarily due to traffic noise, the minimum weighted sound reduction, R_w , of the external façade will need to be R_w 30 dB to ensure that an internal specification of 30 $L_{Aeq, 8\text{hours}}$ dB maximum is met within the noise sensitive dwelling areas during nighttime periods, as determined within the WHO recommendations. The L_{Amax} of 64 dB will be attenuated such that the internal level will be 34 L_{Amax} dB, again in line with the requirements of WHO.

Any party internal wall construction will need to provide the minimum acoustic requirements necessary to meet with the Building Regulations of $D_{nT,w} + C_{tr}$ 45 dB for airborne noise transmission, when considered between all residential dwellings.

The roof of the building should be built to provide the necessary sound insulation to meet the Building Regulations with respect to the passage of sound.

13.2 Glazing Units

The primary weakness in any building envelope is usually due to windows, ventilation louvres and other apertures.

The development will not have air conditioning installed within the noise sensitive residential areas of this developments, other than extraction from the bathrooms and kitchen hoods, which are self contained within dwelling, and therefore the only area of concern are the window systems.

In order to provide adequate attenuation against the noise levels in the area and achieve the Building Regulations and WHO criteria, it is recommended that the glazing employed on these developments should be a sealed unit double glazing incorporating acoustic trickle vents.

Using the noise exposure levels assessed for the site the minimum recommended Weighted Sound Reductive Index, R_w , for the glazing should be as follows.

Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD

Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

Period	Noise Exposure Level	Maximum Internal Bedroom Target Level	Minimum Rw Values Required
Daytime (0700 – 2300 Hrs)	LAeq, 16 Hours – 49 dB	LAeq, 16 Hours – 35 dB	Rw 15 dB
Night-time (2300 – 0700 Hrs)	LAeq, 8 Hours – 43 dB LAm _{ax} - 64 dB	LAeq, 8 Hours – 30 dB LAm _{ax} - 45 dB	Rw 13 dB Rw 19 dB

Based upon generic acoustic data the acoustic properties of a double glazing system containing a **4-20-4**, float glass – air - float glass combination, provides an acoustic sound insulation of **Rw 31 dB**. This is the recommended minimum combination and acoustic properties necessary to achieve the minimum requirements for these development sites.

If we consider an opening a window within a bedroom to provide additional room ventilation, the accepted attenuation value of the open window is 15 dB, this would allow for an internal noise level within a bedroom of 28 LAeq dB. This level of ingress is deemed as not likely to result in sleep disturbance due to external sources, set at 30 LAeq dB within WHO. Considering the early morning birdsong contribution, the LAm_{ax} dB would result in a 49 dB level. This is above recommendations set at 45 LAm_{ax} within WHO.

To avoid disturbance due to external noise sources and still provide adequate ventilation within a bedroom areas, an alternative to opening a window would be to consider installation of a sealed unit double glazing system with integral acoustic trickle ventilation system.

The glazing provided for this project must include for the a trickle ventilation system that provides both adequate background ventilation in accordance with Approved Document F1 and the minimum acoustic properties to maintain the internal noise characteristics of a closed window using a through frame ventilator. The acoustic values quoted above do not include for the trickle vent combination within their values and as such inclusion of a standard trickle vent will diminish the overall Rw values quoted. The acoustic criteria for small build elements is the Dn,e,w dB indices, which is approximately 6dB lower in value than an Rw figure for comparison purposes of indices.

The acoustic properties of the acoustic trickle vent system proposed for use on this site, the Passivent TVALdB 450/40 will achieve a specified sound reduction of **40 Dn,e,w dB** through the ventilator. This level of attenuation is equivalent to Rw 34 dB and as such is achieving the minimum requirements necessary to ensure that the internal noise levels inside the bedrooms

Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

are maintained for all elevations of this project when the combined value of the glazing and ventilator system is considered.

Other manufacturers could be considered provided that the $D_{n,e,w}$ dB value is maintained.

13.3 External Recreational Areas

There will be no need for acoustic treatment to the external recreational areas forming part of the development since the site is experiencing noise levels below that at which disturbance to amenity will result due to external sources.

The level at which noise is classified as an issue with respect to moderate annoyance during daytime / evening periods is above 50 $L_{Aeq, 16hours}$ dB, according to TAN 11 and WHO recommendations, as noted within Section 4 above; therefore, no mitigating noise control will be necessary since the external noise criteria has been assessed as 49 $L_{Aeq, 16hours}$ dB.

It is therefore recommended that the individual garden areas are separated and bounded to account for allowance of privacy only without the need to consider the acoustic properties of the separation product utilized. This is especially true for the residential property bounding the industrial estate to the east, where a minimum 2m high close boarded fence is recommended in addition to the existing palisade boundary fence.

14.0 Report Summary

An attended noise survey was carried out of the existing environmental noise exposure over a typical 24-hour weekday on 28th / 29th June 2010, by the writer, in respect of the planning application for proposed erection of 12 No semi-detached residential dwellings on land at site No 82, Whitegate Road, Wrexham.

The noise levels recorded during the survey were utilized to provide the raw data to carry out an assessment of the site in accordance with the rating levels laid down in Technical Advice Note 11, TAN 11. The TAN 11 Rating is used by the local authorities to assess the proposal for residential developments close to existing noise sources with view to granting planning permission.

The results indicate that the site is subject to **Categories A**, during the survey period, with the primary background environment being due to traffic noise along the local road network.

As this is an outline planning application, no finalized plans of the specific building envelope exists for acoustic analysis or appraisal, therefore, in the absence of these details, any proposed building fabric will need to provide a minimum of Rw 30 dB to ensure that the internal noise levels are maintained in line with WHO recommendations.

Recommendations have been proposed for the double-glazing systems to be employed on this development, in order to achieve the internal dwelling room design target exposure levels as determined within WHO recommendations.

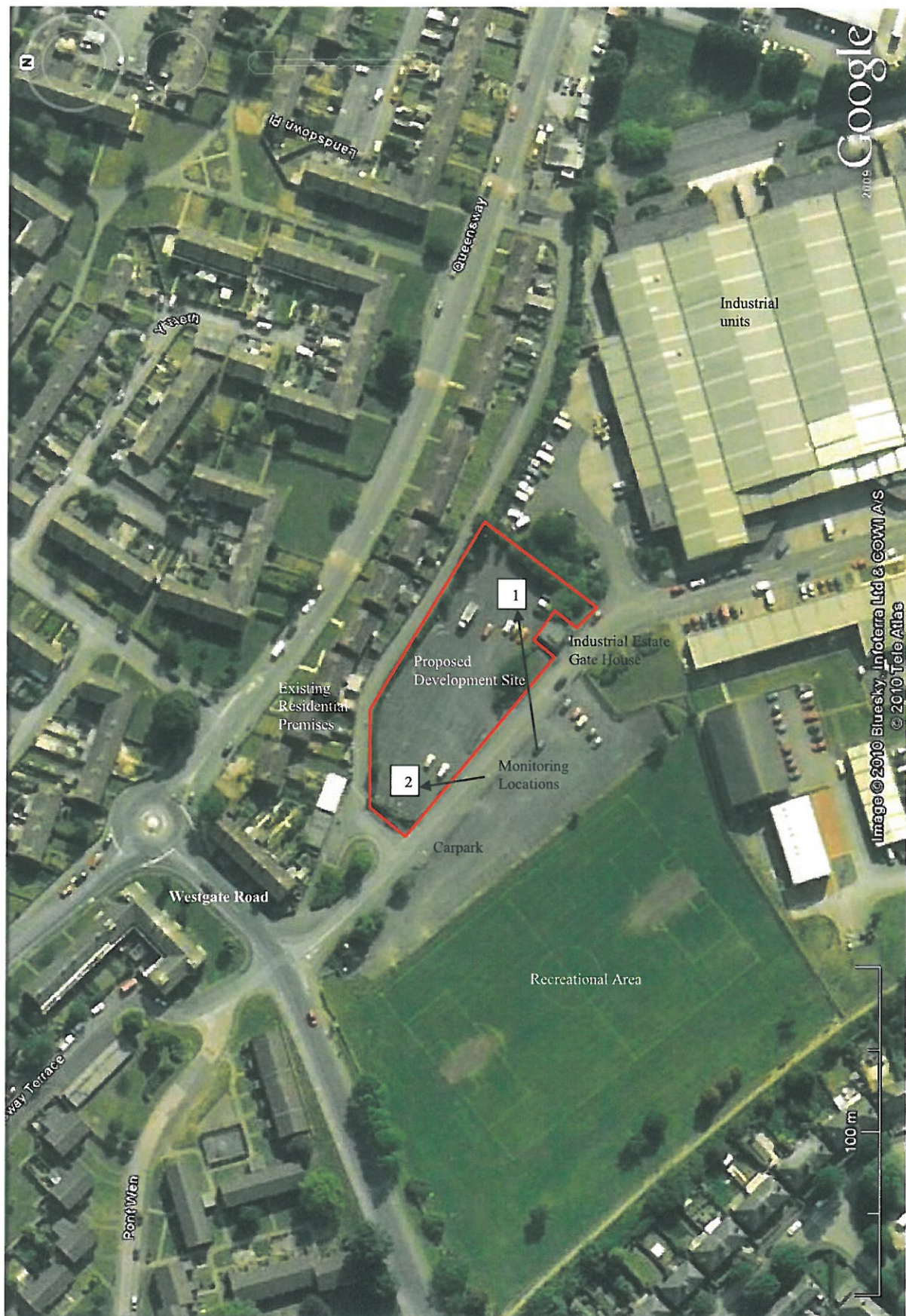
Glazing Recommendation, 4-20-4 float glass-air-float glass combination, with acoustic trickle vents.

No additional recommendations are necessary in order to provide an acceptable amenity for the external recreational areas of the development to allow undisturbed use of the outdoor spaces other than consideration of privacy between boundaries.

Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

APPENDIX A – Locational Plan and Survey Position



Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

APPENDIX B - Noise Survey Frequency Results Table 1 of 2

PROPOSED WHITEGATE ROAD SITE - NOISE SURVEY RESULTS TABLE

Octave Band Frequency Results Data																		
Map Location	Survey Period	Description of Location	Data ID	L _{Amax} dB	L _{Amin} dB	L _{Aeq} dB	Octave Band Frequency Results Data										LA90 dB	TAN 11 Category
							63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz				
1	10.00 - 11.00	East site boundary location 2m from boundary fence.	1	72.7	38.1	50.5	63.9	62.1	52.3	44.8	43.1	39.4	38.8	33.0	53.2	41.5	A	
1	11.00 - 12.00		3	61.9	38.9	45.9	60.0	49.0	43.7	41.7	41.0	37.6	34.5	30.3	48.2	42.1	A	
1	12.00 - 13.00		5	63.8	39.8	48.3	61.3	55.2	48.0	44.8	41.5	38.6	39.0	33.0	51.0	43.6	A	
1	13.00 - 14.00		7	62.6	40.3	48.2	59.2	52.3	47.0	43.6	43.0	38.4	40.0	27.4	50.9	43.1	A	
1	14.00 - 15.00		9	74.0	39.2	48.7	60.4	51.4	46.9	45.0	43.5	40.5	38.5	30.9	50.1	42.7	A	
1	15.00 - 16.00		11	57.2	41.7	49.4	62.2	53.5	46.7	44.9	43.5	41.2	40.2	38.0	52.3	44.3	A	
1	16.00 - 17.00		13	73.7	41.3	54.2	64.4	56.8	53.9	51.9	50.9	48.2	40.4	33.7	58.8	45.2	A	
1	17.00 - 18.00		15	73.2	43.1	54.0	64.2	62.4	55.3	48.4	49.3	42.5	43.8	31.4	55.7	46.9	A	
1	18.00 - 19.00		17	54.6	39.0	44.3	56.3	45.3	39.8	41.8	39.9	35.4	32.8	25.5	46.9	40.5	A	
1	19.00 - 20.00		19	62.7	40.0	48.6	59.1	53.7	46.0	43.1	43.6	39.7	40.5	29.6	50.9	43.8	A	
1	20.00 - 21.00		21	62.0	34.7	46.0	54.5	54.6	43.8	39.8	41.9	38.1	28.3	22.2	49.2	37.1	A	
1	21.00 - 22.00		23	63.1	34.8	42.0	52.6	44.4	39.0	35.4	37.6	35.0	30.4	25.7	44.8	36.4	A	
1	22.00 - 23.00		25	42.2	35.2	38.3	47.7	42.5	38.4	33.3	34.1	29.1	22.9	24.1	40.6	36.5	A	
1	23.00 - 00.00		27	49.9	34.0	38.5	48.1	42.9	38.3	33.4	34.6	30.0	24.6	19.9	40.4	35.0	A	
1	00.00 - 01.00		29	41.2	36.2	38.0	44.1	44.7	39.1	32.4	30.4	30.3	28.7	24.0	38.8	37.1	A	
1	01.00 - 02.00		31	38.8	35.5	37.0	43.5	42.9	38.5	32.3	30.6	29.1	26.2	21.4	38.1	36.2	A	
1	02.00 - 03.00		33	47.0	32.2	35.8	55.1	46.2	37.5	30.0	28.5	23.3	18.5	16.2	37.1	33.3	A	
1	03.00 - 04.00		35	41.0	32.1	35.0	41.2	42.3	36.1	31.8	29.5	25.5	19.1	16.2	37.1	33.2	A	
1	04.00 - 05.00		37	44.5	35.5	39.1	50.0	43.5	37.3	36.3	32.9	28.7	31.7	20.0	41.0	37.1	A	
1	05.00 - 06.00		39	52.5	36.7	41.7	49.3	44.4	38.5	38.1	36.8	32.3	33.8	21.9	44.0	38.7	A	
1	06.00 - 07.00		41	61.4	38.5	49.1	55.2	47.1	43.1	41.4	40.9	38.2	45.9	29.5	52.8	41.4	B	
1	07.00 - 08.00		43	65.3	38.3	49.5	61.2	52.3	48.6	43.9	43.0	41.0	43.0	28.9	52.2	42.2	A	
1	08.00 - 09.00		45	73.9	42.4	53.1	66.3	55.9	50.7	48.6	48.8	45.0	41.4	34.7	55.1	46.2	A	
1	09.00 - 10.00		47	71.5	40.8	50.9	64.3	55.1	48.2	45.5	46.3	43.7	39.1	34.3	53.5	45.4	A	

Paul Horsley Acoustics Limited

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

APPENDIX B - Noise Survey Frequency Results Table 2 of 2

PROPOSED WHITEGATE ROAD SITE - NOISE SURVEY RESULTS TABLE

Octave Band Frequency Results Data																	
Map Location	Survey Period	Description of Location	Data ID	L _{max} dB	L _{min} dB	L _{Aeq} dB	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	L _{A10} dB	L _{A90} dB	TAN 11 Category
2	10.00 - 11.00	West site boundary location 3m from boundary hedge.	2	64.1	38.9	47.8	61.5	52.7	49.0	45.1	41.7	37.8	35.9	29.0	51.1	41.7	A
2	11.00 - 12.00		4	63.2	40.2	50.6	66.9	60.4	48.6	43.2	42.8	42.4	39.9	30.3	53.7	44.5	A
2	12.00 - 13.00		6	72.4	39.9	47.8	59.9	55.5	46.0	43.0	42.5	38.4	38.6	30.0	49.9	43.3	A
2	13.00 - 14.00		8	72.6	38.9	48.9	62.2	54.5	48.7	45.1	42.8	38.8	40.1	29.3	51.2	43.2	A
2	14.00 - 15.00		10	65.4	39.0	47.3	59.9	54.1	44.9	42.0	40.9	38.3	40.2	29.9	50.0	43.2	A
2	15.00 - 16.00		12	71.3	42.4	48.7	62.6	51.0	44.9	40.9	41.9	39.2	43.6	35.3	49.9	44.3	A
2	16.00 - 17.00		14	68.3	39.9	52.5	61.5	55.1	48.1	47.9	49.8	43.2	35.4	27.1	55.6	42.5	A
2	17.00 - 18.00		16	70.9	40.3	54.1	64.0	55.5	51.5	49.5	51.4	44.2	39.7	30.4	57.6	45.0	A
2	18.00 - 19.00		18	69.6	40.7	50.1	58.6	50.7	46.8	47.8	45.6	39.9	38.8	28.8	50.2	43.2	A
2	19.00 - 20.00		20	61.2	41.4	48.6	60.5	50.3	45.5	43.8	43.9	40.3	39.6	33.1	51.0	45.3	A
2	20.00 - 21.00		22	64.9	33.1	43.2	54.0	51.7	41.5	38.0	38.7	34.6	27.4	22.1	46.4	36.0	A
2	21.00 - 22.00		24	63.9	33.5	40.3	50.3	45.1	39.1	35.0	36.4	31.5	26.0	23.6	43.4	36.1	A
2	22.00 - 23.00		26	52.2	34.2	42.1	58.7	47.5	40.8	36.0	38.0	32.7	23.4	22.9	44.6	35.9	A
2	23.00 - 00.00		28	42.8	33.7	36.5	43.0	42.2	37.5	31.7	30.6	28.4	25.7	20.8	38.2	34.6	A
2	00.00 - 01.00		30	47.0	35.5	38.5	46.4	44.6	40.4	33.7	30.2	30.5	29.2	24.9	40.3	36.8	A
2	01.00 - 02.00		32	43.9	36.5	39.0	44.6	44.1	39.4	33.5	32.9	31.9	29.0	23.8	40.3	37.8	A
2	02.00 - 03.00		34	42.0	29.5	33.2	50.6	39.3	32.6	28.4	28.1	24.8	18.7	16.0	34.9	30.8	A
2	03.00 - 04.00		36	46.1	31.7	33.9	42.4	38.6	34.8	29.7	28.6	26.1	20.1	16.4	34.7	32.5	A
2	04.00 - 05.00		38	48.8	37.5	40.2	51.8	42.9	36.9	38.0	33.6	29.7	32.4	27.0	41.9	38.6	A
2	05.00 - 06.00		40	64.5	38.5	48.4	51.2	45.7	39.6	38.8	38.7	40.5	45.1	30.0	51.3	41.1	B
2	06.00 - 07.00		42	59.6	41.4	46.4	56.7	48.1	41.0	41.6	40.3	40.6	37.4	26.1	48.5	43.6	B
2	07.00 - 08.00		44	67.3	38.3	50.1	60.7	55.8	49.9	46.0	43.9	41.0	41.8	29.8	52.5	43.0	A
2	08.00 - 09.00		46	76.0	44.3	54.4	63.6	57.7	51.4	47.4	48.4	49.0	43.7	38.1	56.0	48.6	A
2	09.00 - 10.00		48	67.0	40.7	49.5	60.3	51.6	44.4	41.7	42.7	44.0	42.0	32.5	51.4	43.3	A

1 Upper Lane, Gomersal, Cleckheaton, West Yorkshire, BD19 4JD
Tel/Fax 01274 879 020 E-Mail: paul.horsley@homecall.co.uk

[illegible]