Proposed Residential Development
Land off Port Road
Wenvoe
CF5

Environmental Noise Survey
3297/ENS1

13th January 2014

For: **Redrow Homes (South Wales) Ltd**

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Contents

1.0 Introduction

A residential development is proposed on land off Port Road, Wenvoe, CF5.

The A4050 Port Road public highway lies on the south-eastern boundary of the proposed site. Existing dwellings lie to the northeast of the site, as well as a commercial Garden Centre to the south.

This report has been commissioned to assess existing ambient and background noise levels impinging on the site from road traffic. Survey results have been used for comparison with Local Authority Planning Conditions and planning guidance.

Appendix A explains acoustic terminology used in this report.

Appendix B contains graphs, tables and diagrams referenced in this report.

2.0 Planning Guidance

The following planning condition has been issued by the Local Planning Authority relating to road traffic noise;

"Prior to the commencement of development a noise assessment, relating to the road noise from the A4050 adjacent to the site and how this noise might be mitigated from effecting future residents of the development hereby approved, shall be submitted to and agreed in writing by the Local Planning Authority. The development shall be implemented in accordance with the agreed noise assessments recommendations."

2.1 Technical Advice Note (Wales) 11

Noise bands defining categories A-D of TAN 11 are set in terms of $L_{Aeq,16hr}$ daytime, and $L_{Aeq,8hr}$ night time levels for rail traffic noise, free field 1.2 - 1.5m above ground level as follows;

Table 1. Recommended noise exposure categories for new dwellings near existing noise sources (ref Table 2 of TAN 11 (Wales) October 1997)

Noise Source	Time	Noise Exposure Categories			
		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	66-72	>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

Note: In addition, sites where individual noise events regularly exceed 82dB $L_{Amax(slow)}$, several times in any night time hour should be treated as being in NEC C, unless the $L_{Aeq,8hr}$ already puts the site in NEC D.

2.2 Typical Planning Conditions

The following typical planning conditions have been issued by a neighbouring Local Planning Authority relating to road noise, based on guidance from TAN 11 quoted above.

Noise levels in the planning conditions quoted below relate to the boundary between NEC B / C in TAN 11 – i.e. additional acoustic insulation and mechanical ventilation is proposed for NEC C facades.

2.3 Road Noise

Prior to commencement of development a scheme shall be submitted to and approved in writing by the Local Planning Authority to provide that all habitable rooms exposed to external road noise in excess of 63dBA L_{eq} 16 hour (free field) during the day (07.00 to 23.00 hours) or 57dBA L_{eq} 8 hour (free field) at night

(23.00 to 07.00 hours) shall be subject to sound insulation measures to ensure that all such rooms achieve an internal noise level of 40dBA L_{eq} 16 hour during the day and 35dBA L_{eq} 8 hour at night. The submitted scheme shall ensure that habitable rooms subject to sound insulation measures shall be able to be effectively ventilated without opening windows. No dwelling shall be occupied until the approved sound insulation and ventilation measures have been installed to that property in accordance with the approved details. The approved measures shall be retained thereafter in perpetuity.

No habitable room shall be occupied until the approved sound insulation and ventilation measures have been installed in that room.

Gardens shall be designed to provide an area which is at least 50% of the garden area for sitting out where the maximum day time noise level does not exceed 55dBA Leq 16 hour [free field].

3.0 Survey Procedure

Two continuous monitoring positions were established on site to monitor road traffic noise levels.

Additional sample measurements on the site have also been carried out.

Site Plan 3297/SP1 shows measurement positions used during our surveys.

Site Plan 3297/SP1 – Site Plan Showing Measurement Positions

3.1 Continuous Monitoring

Continuous monitoring was carried out from 1300hrs on 9th January 2014 for 24-hours at Positions A and B.

Data including L_{Amax}, L_{Aeq}, and L_{A90} were logged at 5-minute intervals over the monitoring period.

Site Plan 3297/SP1 shows the continuous monitoring positions used, namely:

Position A	On the south-eastern boundary of the proposed site at the location of the proposed dwelling closest to Port Road.
Position B	On the south-western part of the proposed site.

3.2 Sample Measurements

Sample measurements were taken at 3 positions on the proposed site on 9th January 2014.

Site Plan 3297/SP1 shows the sample measurement positions used, namely:

Position 1	Located 3m from the A4050 Port Road.
Position 2	At the entrance to the north field, on the public footpath.
Position 3	At the first bend of the public footpath in the north field. Line of sight to the road still intact.

The sample measurements were taken in accordance with the shortened measurement procedures outlined in Department of Transports “Calculation of Road Traffic Noise 1988” (CRTN) over a 3-hour period to gather source noise data for Port Road across the site.

These measurements are also used to aid calibration of a noise map.

Parameters recorded include L_{Amax} and L_{Aeq} levels including 1/3-octave band L_{eq} spectra.

3.3 Personnel and Equipment

Personnel Present: Paul McGrath of Hunter Acoustics
Gavin Wong of Hunter Acoustics

Date of Survey: 9th & 10th January 2014

The following equipment was used during our survey;

Table 3297/T1 – Equipment List

Make	Description	Model	Serial Number	Last Calibrated	Certificate No.	Calibration Due
Norsonic AS	Type 1 - Integrating - averaging Sound Level Meter	140	1403003	16-Sep-13	U14448	16-Sep-15
Norsonic AS	Preamplifier	1209	12403	16-Sep-13	U14448	16-Sep-15
Norsonic AS	Microphone	1225	91797	16-Sep-13	11927	16-Sep-15
Norsonic AS	Calibrator (114.11dB @ 1001.90Hz)	1251	31826	16-Sep-13	U14446	16-Sep-14
Larson Davis	Type 1 - Sound Level Meter	820	1334	09-May-13	20437	09-May-15
Larson Davis	Preamplifier	828	1960	09-May-13	20437	09-May-15
PCB	Microphone 1/2" Prepolarized FF	377B02	LW135480	09-May-13	20437	09-May-15
Rion	Type 1 - Sound Level Meter	NL-32	01103396	25-Feb-13	1302066	25-Feb-15
Rion	Preamplifier	NH-21	34335	25-Feb-13	1302066	25-Feb-15
Rion	Microphone	UC-53A	317921	25-Feb-13	1302066	25-Feb-15

Measurement systems were calibrated before and after the survey, no variation occurred.

3.4 Weather Conditions

Weather conditions were wet, cold and with a gentle breeze throughout the survey period. There was an occasional light rain shower during the evening and early hours of the morning.

4.0 Survey Results

4.1 Continuous Monitoring

Time History Graphs 3297/TH1 & TH2 shows L_{Amax}, L_{Aeq} and L_{A90} sound pressure levels measured at Position A & B over the 24-hour period.

The following $L_{Aeq,16hr}$ daytime and $L_{Aeq,8hr}$ night-time noise levels have been measured;

Position A				
Daytime	0700-2300hrs	Leq,16hr	= 57.0	NEC B
Night-time	2300-0700hrs	Leq,8hr	= 52.3	NEC B

Position B				
Daytime	0700-2300hrs	Leq,16hr	= 48.3	NEC A
Night-time	2300-0700hrs	Leq,8hr	= 43.7	NEC A

There were no events recorded during the night that exceeded 82dB L_{Amax} during night time period.

4.2 Sample Measurements

Results of the road traffic noise surveys at Positions 1-3 are shown in Table 3297/T2 below. The table goes on to predict the $L_{eq,16hr}$ daytime road traffic source noise level using methodology specified in CRTN and TAN 11.

Source Road octave band spectra are shown in Graph 3297/G1 in Appendix B.

Table 3297/T2 – $L_{eq,16hr}$ Daytime Road Traffic Noise Predictions

CRTN Position 1	L_{Aeq} (dB)	L_{A10} (dB)	$L_{Amax,F}$ (dB)
1200-1300hrs	74.2	77.5	83.5
1300-1400hrs	73.9	77.2	84.7
1400-1500hrs	74.3	77.6	86.5

Mean L_{10}	77.4
**16hr L_{eq}	74.4

CRTN Position 2	L_{Aeq} (dB)	L_{A10} (dB)	$L_{Amax,F}$ (dB)
1200-1300hrs	51.7	53.8	68.0
1300-1400hrs	53.6	55.2	70.0
1400-1500hrs	51.2	52.7	62.5

Mean L_{10}	53.9
**16hr L_{eq}	50.9

CRTN Position 3	L_{Aeq} (dB)	L_{A10} (dB)	$L_{Amax,F}$ (dB)
1200-1300hrs	46.0	47.0	72.7
1300-1400hrs	46.4	48.5	66.4
1400-1500hrs	46.3	47.7	64.2

Mean L_{10}	47.7
**16hr L_{eq}	44.7

**Predicted in accordance with CRTN and TAN11

5.0 Noise Map

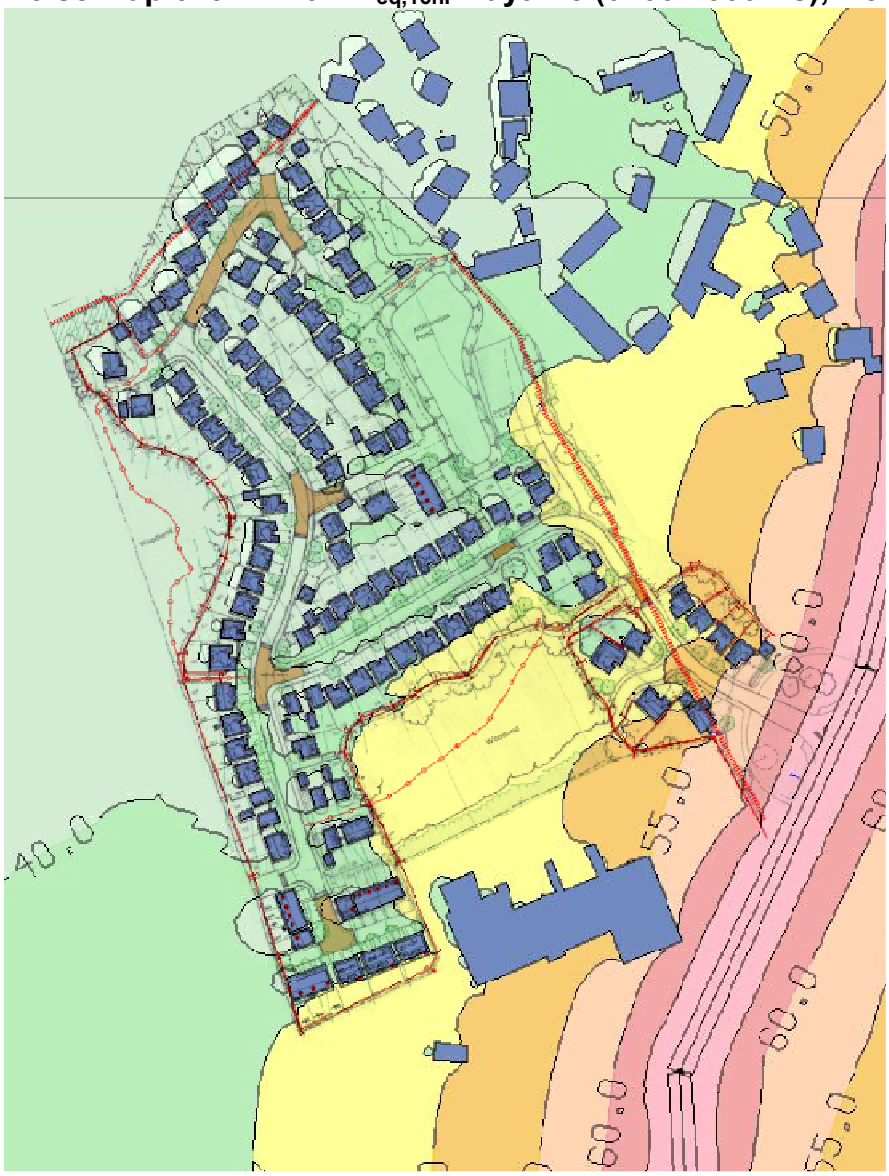
Site noise surveys have been carried out confirming road noise levels impinging on the site. Results from the noise surveys discussed above have been used to calibrate a noise map model. Noise maps have been plotted using Noise Map Five (5.0.17) software, which in turn uses methodology from Department of Transport's Calculation of Road Traffic Noise (CRTN).

Noise map model includes for distance losses and screening from the garden centre building and 1.8m boundary fence.

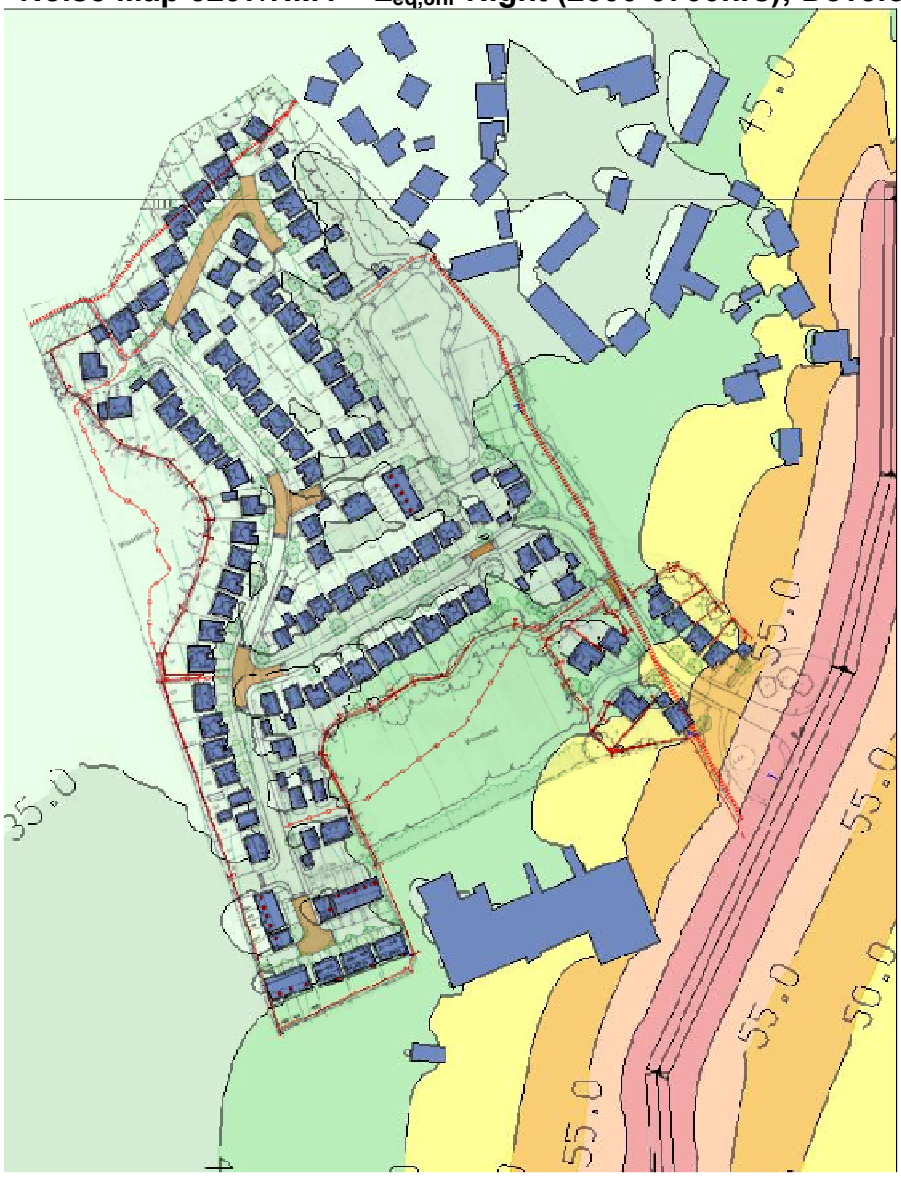
Noise maps 3297/NM1 & NM2 in Appendix B show predicted daytime and night-time noise levels respectively at 1.5m above local ground level on the undeveloped site.

Noise map 3297/NM3 & NM4 below shows predicted daytime and night-time noise levels at 1.5m above local ground level across the developed site.

Noise Map 3297/NM3 – $L_{eq,16hr}$ Daytime (0700-2300hrs); Developed Site



Noise Map 3297/NM4 – $L_{eq,8hr}$ Night (2300-0700hrs); Developed Site



5.1 Discussion

Road traffic noise controls the ambient noise climate. Noise levels across the site are indicated to fall under NECs A & B by day and night and therefore fall beneath trigger levels quoted in the typical planning conditions. Additional sound insulation measures would therefore not be necessary. Standard thermal double glazing and trickle ventilation sufficient.

Garden criterion is indicated to be met across the site.

6.0 Conclusion

An environmental noise survey has been carried out to assess existing ambient and background noise levels impinging on the proposed development site on land off Port Road, Wenvoe, CF5 from local road traffic. Road traffic noise controls the ambient noise climate.

Daytime and night-time noise maps have been plotted across the proposed development site. Noise levels are indicated to fall within NECs A & B of TAN 11 and below trigger levels quoted in the typical planning condition. No additional sound insulation measures are indicated to be required. Standard thermal double glazing and trickle ventilation sufficient.

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Appendix A

Acoustic Terminology

Human response to noise depends on a number of factors including; loudness, frequency content, and variations in level with time. Various frequency weightings and statistical indices have been developed in order to objectively quantify 'annoyance'.

The following units have been used in this report:

dB(A): The sound pressure level weighted to correspond with the frequency response of the human ear, and therefore a person's subjective response to frequency content.

L_{eq}: The equivalent continuous sound level is a notional steady state level which over a quoted time period would have the same acoustic energy content as the actual fluctuating noise measured over that period.

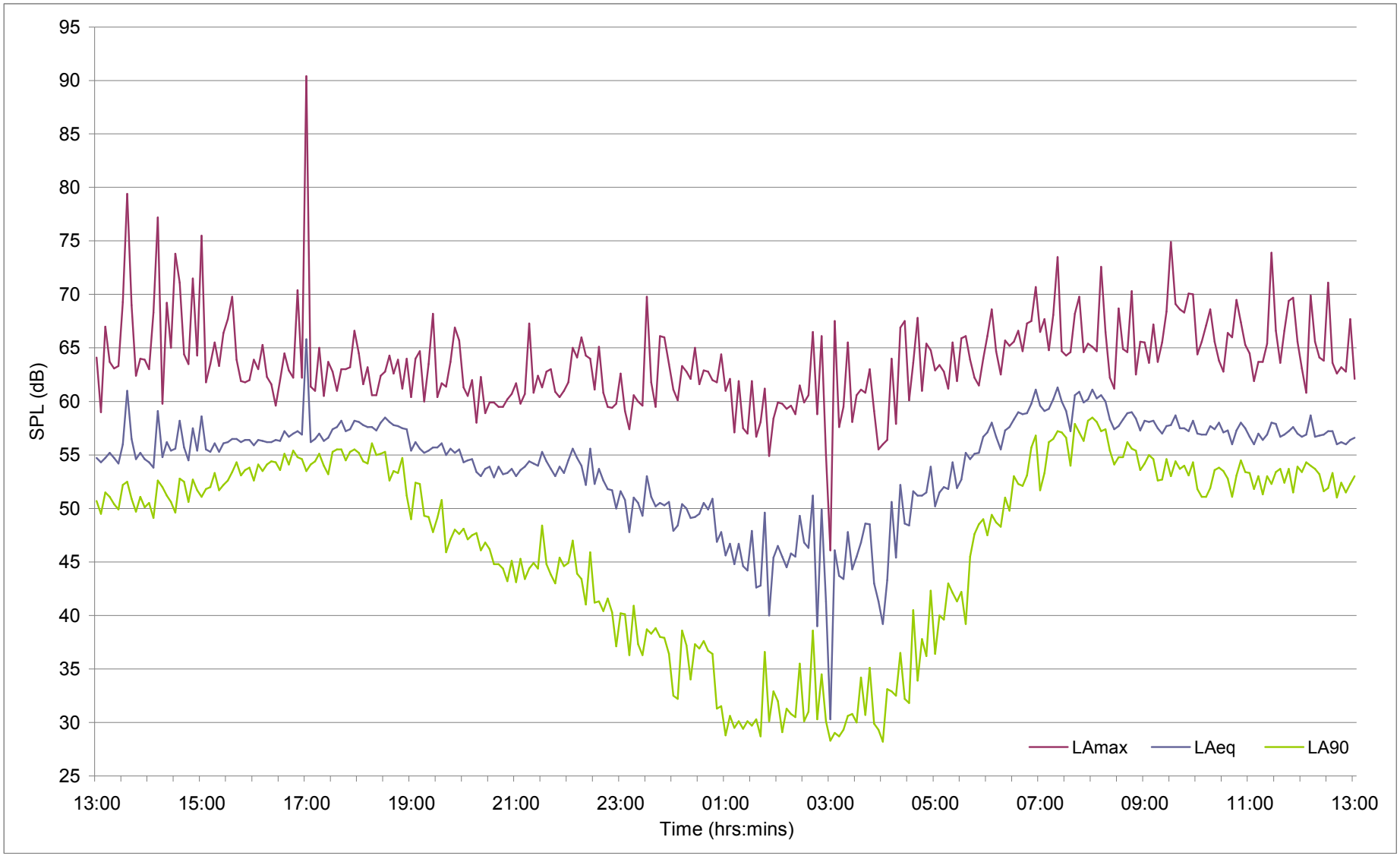
L_{90}: The sound level which is exceeded for 90% of the measurement period. i.e. The level exceeded for 54 minutes of a 1-hour measurement. It is often used to define the background noise level.

L_{10}: The sound level which is exceeded for 10% of the measurement period. i.e. The level exceeded for 6 minutes of a 1-hour measurement

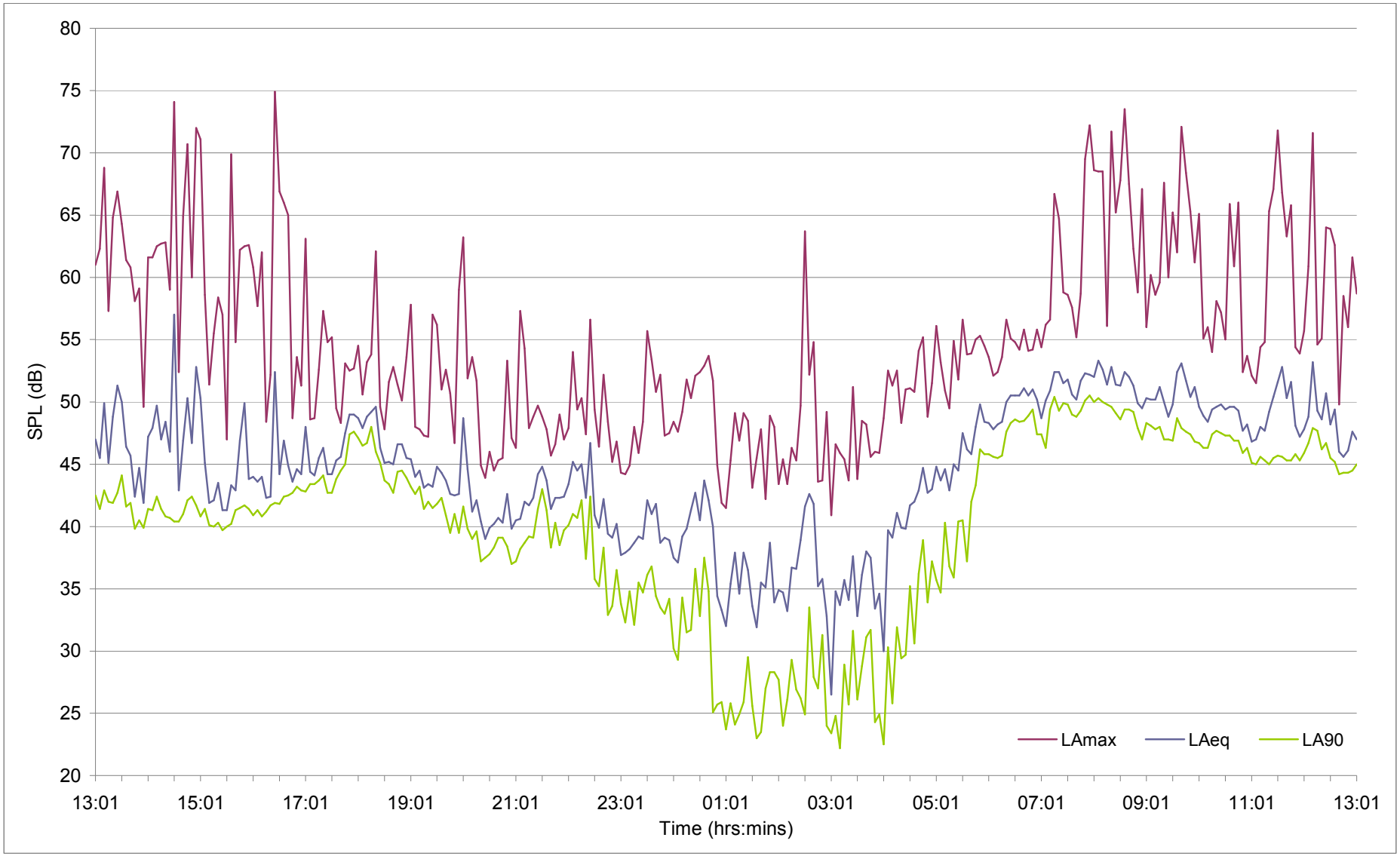
SEL: 'Sound Exposure Level', The dB(A) level which, if it lasted 1 second, would produce the same sound energy as the event in question (e.g. a train pass-by).

Appendix B

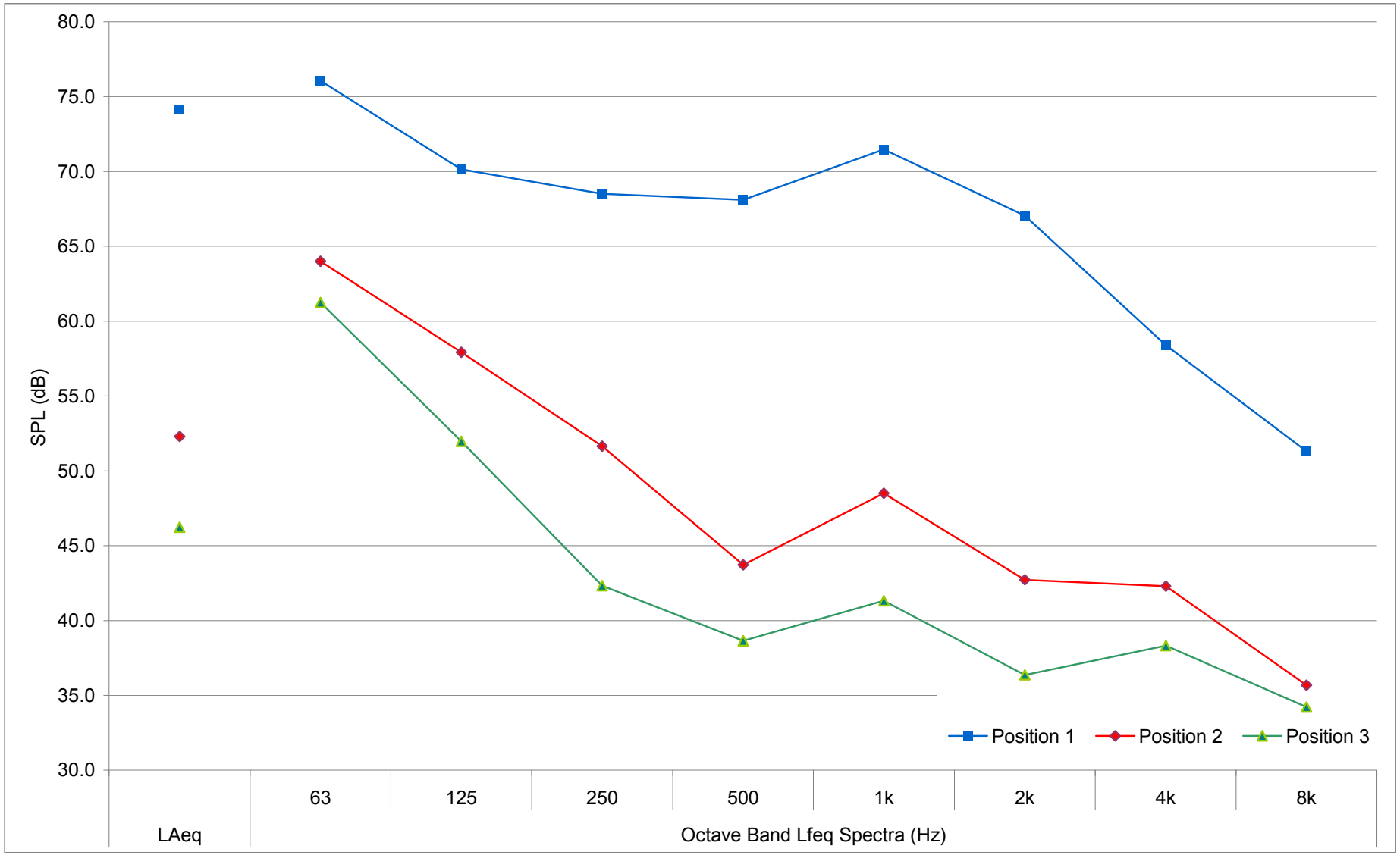
Time History 3297/TH1 – Continuous Monitoring Time History at Position A



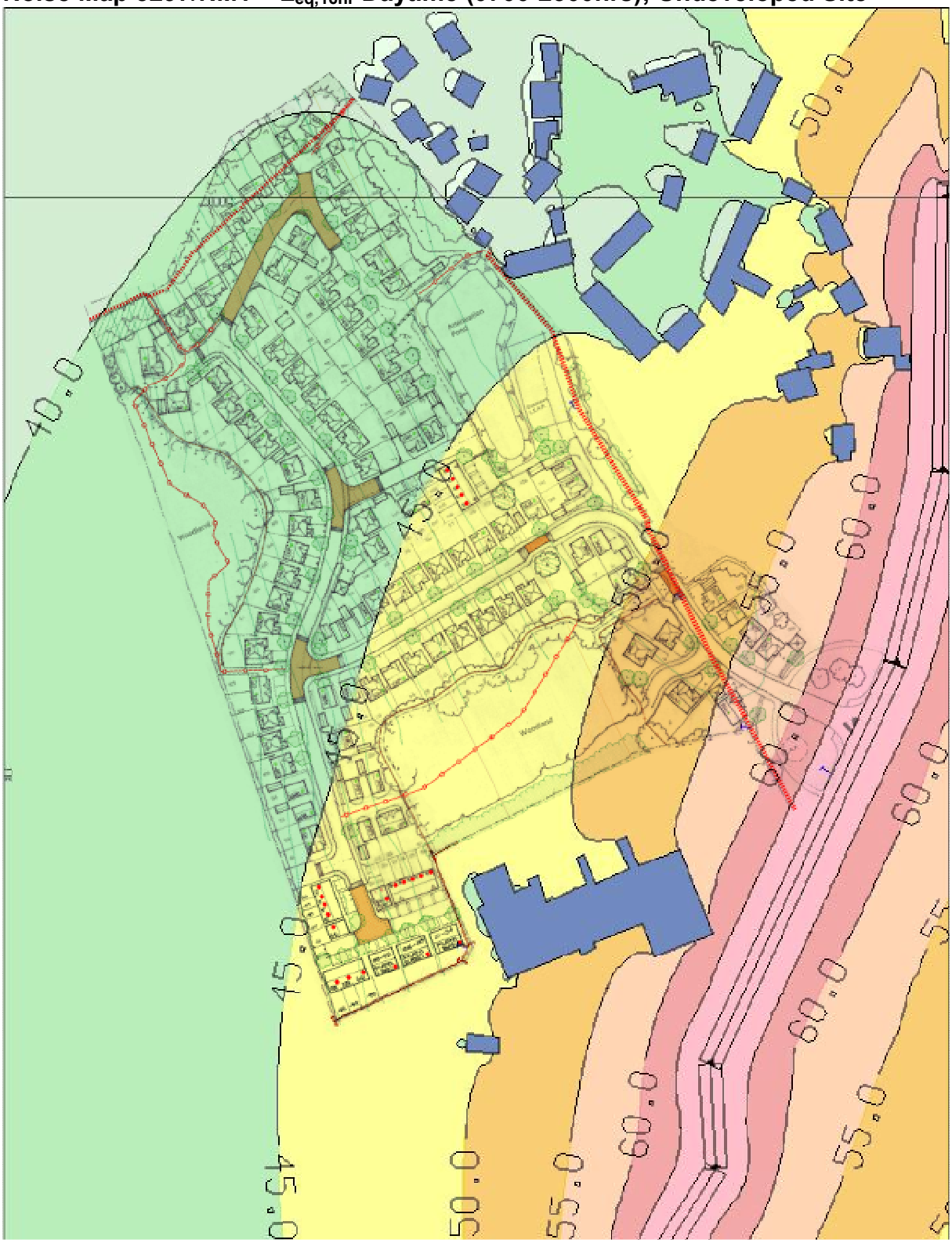
Time History 3297/TH2 – Continuous Monitoring Time History at Position B



Graph 3297/G1 – Source Road Octave Band L_{eq} Spectra at Positions 1-3



Noise Map 3297/NM1 – $L_{eq,16hr}$ Daytime (0700-2300hrs); Undeveloped Site



Noise Map 3297/NM2 – $L_{eq,8hr}$ Night-time (2300-0700hrs); Undeveloped Site