

TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
2.0	LOCAL AUTHORITY CONDITIONS FOR THE DEVELOPMENT.....	2
3.0	SITE SURVEY.....	3
4.0	APPLICABLE STANDARD USED FOR ASSESSMENT.....	4
5.0	MEASUREMENT INSTRUMENTATION.....	5
6.0	MEASURED RESULTS Table 1.....	6
7.0	SUMMARY OF RESULTS.....	7-8
8.0	CONCLUSION AND RECOMMENDATIONS	9
	ANNEX A...GLOSSARY OF ACOUSTIC TERMS.....	10-11

1.0 INTRODUCTION

- 1.1 The proposal is for a development of five detached houses on land at Clarendon Avenue, Stansty, Wrexham, LL11 2DF. (Application number WRR P/2008/0733).
- 1.2 Planning permission for the development has been granted subject to the submission of an acoustic report to show to show the impact of t rail traffic noise on the development and noise reduction measures to comply with the Wrexham County Borough Council requirements for acceptable noise in habitable rooms.
- 1.3 At the request of the developer, Cheshire Environmental Associates has been commissioned to undertake this acoustic survey. The scope of the assessment is to evaluate the impact of rail traffic noise on the development and to recommend noise reduction measures to ensure compliance with the Local Authority noise levels in habitable rooms.

2.0 LOCAL AUTHORITY CONDITIONS FOR THE DEVELOPMENT

2.1 As part of the planning permission Wrexham County Borough Council have stated the following planning conditions:

Prior to the development commencing, a noise survey report should be submitted to the Local Planning Authority to include:

- (a) Noise levels arising from day/night activities arising from the railway in the vicinity to the proposed development site and the impact on the development. and the impact on the proposed accommodation;
- (b) A detailed scheme of noise insulation and /or attenuation measures so designed to safeguard the amenity of the future occupants of the proposed accommodation that is approved.

All data shall be representative of typical conditions for both day (07.00 – 23.00 hours) and night (23.00 – 07.00 hours).

3.0 SITE SURVEY

- 3.1 The development is adjacent to the Chester to Shrewsbury railway line.

Information obtained from Chester to Shrewsbury Rail Partnership indicates trains start running at 05.30 hours and end 00.33hours.

- 3.2 Adjacent to the site are located existing garage buildings. Although the Local Authority have not requested an evaluation assessment for garage workshop noise, noise from the garage is low and an evaluation for garage workshop noise carried out using BS 4142: 1997 procedure.

4.0 APPLICABLE STANDARDS FOR THE ASSESSMENT

- 4.1 BS 8233 criteria for noise levels in bedroom for the night time period (23.00 – 07.00 hours) is $L_{\text{aeq}} (8\text{-hours})$ 30dB. For a single event the recommended level inside the bedroom is L_{Amax} is 45dB.
- 4.2 The recommended level for habitable rooms such as living rooms, dining rooms and kitchens for the daytime period (07.00 – 23.00 hours) is $L_{\text{aeq}} (16\text{hours})$ 35-40dB(A).
- 4.3 The recommended noise level for gardens and open spaces is less than $L_{\text{aeq}} (16\text{-hours})$ 55dB(A).

5.0 INSTRUMENTATION USED FOR MEASUREMENT

- 5.1 Measurement was carried out over a 24 –hour period commencing on Friday 17th January 2014 and ended 21st January 2014.
- 5.2 Noise measurements were made using Bruel and Kjaer 2236 Type 1 Precision Sound Level meter (Serial No. 811030B). The instrument was calibrated before the start of measurements and at the end of each measurement period.
- 5.3 The sound level meter and calibrator have a calibration certificate.
- 5.4 A windshield was used on the sound level meter.
- 5.5 Weather condition was satisfactory for noise measurement being dry and very little or no wind.
- 5.6 All measured values have been rounded up or down.
- 5.7 All railway noise measurements were carried out at the entrance to the first floor office above the garage workshop. The noise meter was positioned at the entrance of the office door (metal staircase) facing directly towards the railway line. This location ensured measurements for rail traffic noise and also security for the noise meter if it rained. Fortunately it did not rain during the whole time period when measurements were carried out.
- 5.8 Table 1 gives measured noise for railway noise and garage noise.

6.0 MEASURED RESULTS

Table 1. Measured noise level for proposed residential development Land off Clarendon Avenue, Stansty, Wrexham, LL11 2DF

Date	Time Start (hours)	Time End (hours)	Location of measurement	Result dB(A)
	10.00	11.00	First floor office entrance door facing railway track	L _{aeq} 49 L _{max} 78
17/1/2014	11.00	13.00	First floor office entrance door facing railway track	L _{aeq} 56 L _{max} 85
17/1/2014	13.00	14.00	First floor office entrance door facing railway track	L _{aeq} 54 L _{max} 85
17/1/2014	14.00	15.00	First floor office entrance door facing railway track	L _{aeq} 57 L _{max} 82
17/1/2014	15.00	23.00	First floor office entrance door facing railway track	L _{aeq} 58 L _{max} 85
20/1/2014 - 21/1/2104	23.00	07.00	First floor office entrance door facing railway track	L _{aeq} 44 L _{max} 82
21/1/2014	07.00	10.00	First floor office entrance door facing railway track	L _{aeq} 54 L _{max} 84
21/1/2014 Measurement for BS 4142 evaluation	10.15	12.15	Garage workshop noise measurement. In vehicle parking yard 5 metres from garage building. Noise meter facing towards garage workshop.	L _{aeq} 53 L _{a90} 49
21/1/2014 Measurement for BS 4142 evaluation	12.20	13.20	Background measurement. Measurement location outside garage workshop site opposite No 37 Western Drive LL11 2DE	L _{aeq} 53 L _{a90} 43

7.0 ASSESSMENT OF RESULTS AND RECOMMENDATIONS FOR WINDOW GLAZING

7.1. Assessment of measured results

Table 1 gives measured day time noise levels on site

Day period (07.00-23.00 hour)

The average rail traffic daytime noise level **outside** a living room window $L_{aeq(16\text{-hours})}$ 55dB(A). Standard window glazing 6/12/4mm glass gives R_{tra} 25dB(A) attenuation. This glazing should be used for all living rooms, dining rooms, kitchen and bathrooms for the whole of the development.

Trickle ventilation should be provided for all living rooms, dining rooms, kitchen and bathrooms for the development. The ventilation should give minimum attenuation $D_{n,e}$ 25dB(A).

7.2 Table 1 shows measured night -time noise levels on site

Night- time 00-07.00 hour)

The average rail traffic night-time noise level **outside** a bedroom window $L_{aeq(8\text{-hours})}$ 55dB(A). The highest L_{amax} is 82dB(A). For bedroom windows for the whole development double- glazing 13/12/13mm glass should be used. This type of window units will give an attenuation of R_{tra} 40dB(A). The predicted level in a bedroom for the development is $L_{aeq(8\text{-hours})}$ 15dB(A) and a L_{Amax} of 42dB(A). Alternatively, Saint-Globin Solarglass recommend double-glazed unit 10.8mm Stadip Silence glass / 20mm air cavity/ 8.8mm Stadip Silence glass. This glazing gives R_{tra} 40dB(A) noise reduction. A further alternative is triple glazing but the triple glazing selected must provide **R_{tra} 40dB(A)** noise reduction as opposed to R_w 40dB.

Trickle ventilation should be provided for all living rooms, dining rooms, kitchen and bathrooms for the development. The ventilation should give minimum attenuation $D_{n,e}$ 40dB(A).

7.3 The recommended noise level for gardens and open spaces is less than $L_{aeq(16\text{-hours})}$ 55dB(A). The average measured rail traffic noise during the day time period is $L_{aeq(16\text{-hours})}$ 55dB(A). Cheshire Environmental Associates recommend a 1.8 metre high closely boarded timber fence at the boundary separating the rail track from the development and the garage buildings from the development.

7.4 BS 4142 assessment

Source noise from garage = $L_{\text{aeq (2-hours)}}$ 53dB(A).

Residual noise between 12.00 –13.20 hours = $L_{\text{aeq (60 min)}}$ 53dB(A)

Correction for residual noise = 0dB

Background noise between = $L_{90 (60 \text{ min})}$ 43dB(A).

Correction for tonal characteristic of noise = +5dB(A)

Rating value of source noise = $53 + 5 = 58 - 43 = 10\text{dB(A)}$ above background level.

Assessment indicates noise complaints are likely. Window glazing 6/12/4mm standard glazing should be installed to attenuate noise levels in habitable rooms such as living room, dining rooms and kitchens.

8.0 CONCLUSION

- 8.1 At the request of the developer, Cheshire Environmental Associates has carried out this acoustic assessment. The aim is to evaluate the impact of rail traffic noise on the development.
- 8.2 Section 7.1 and 7.2 gives recommendations for sound reduction measures for windows.

Section 7.1 and 7.2 also recommends noise attenuation for ventilation for habitable rooms.
- 8.3 In section 7.3 provides for a 1.8 metre high acoustic fence at the perimeter of the site separating the rail track from the development.

ANNEX A
GLOSSARY OF TERMS

A-weighting:

Approximation of the way the human auditory system hears sound. The weighting emphasises the energy at high and low frequencies in favour of the mid-frequency range which humans are more likely to possess.

Decibel (dB):

A unit of noise derived from the ratio between a measured level and a reference value. The threshold of normal hearing is in the region of 0dB whereas the threshold of pain is 140dB.

dB(A):

Decibels measured on a sound level meter incorporate a filter or weighting to mimic the way the sound is heard by the human ear. A change of 1dB(A) is only perceptible under controlled conditions and the average individual can only determine changes of over 3dB(A).

 L_{Aeq} :

Known as the equivalent continuous noise level, L_{Aeq} is the A-weighted energy level of fluctuating noise emission.

L_{amax} : This is a single event value for instance a motor bike passing by the noise measurement point.