

## **Project**

Serpentine Road, Cleckheaton  
Noise Impact Assessment

## **Prepared for**

McCarthy & Stone Retirement Lifestyles Ltd

## **By**

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## **Published**

25 July 2017

Quality Assurance	
Project Title	Serpentine Road, Cleckheaton
Document Title	Noise Impact Assessment
Client	McCarthy & Stone Retirement Lifestyles Ltd
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Report Number	C/42411A/T01/JPG

### Revision History

Revision	Date	Comments
1	19/06/2017	Original issue
2	04/07/2017	Amended for client comments Barrier location added
3	25/07/2017	Further amendments

## Summary

SRL Technical Services Limited were commissioned by McCarthy & Stone Retirement Lifestyles Ltd to provide a noise impact assessment for residential development of a site in Cleckheaton, adjacent to Serpentine Road.

This report addresses the noise issues highlighted by Kirklees Council in the Pre-application response, specifically the impact of existing commercial uses upon the proposed development.

Acoustic specifications for windows are given for the development to achieve suitable internal noise levels. Standard thermal double-glazed units would be suitable for all living rooms and bedrooms across the site.

The Retirement Living Housing will be mechanically ventilated and limits are given for external and internal plant noise levels. The town houses and Care Home will use standard non-acoustic trickle ventilators.

The impact of noise from an adjacent commercial joinery operation has been considered. Though activity at the joiners appeared to be low, a close boarded fence is proposed along the boundary to protect the townhouses against noise.



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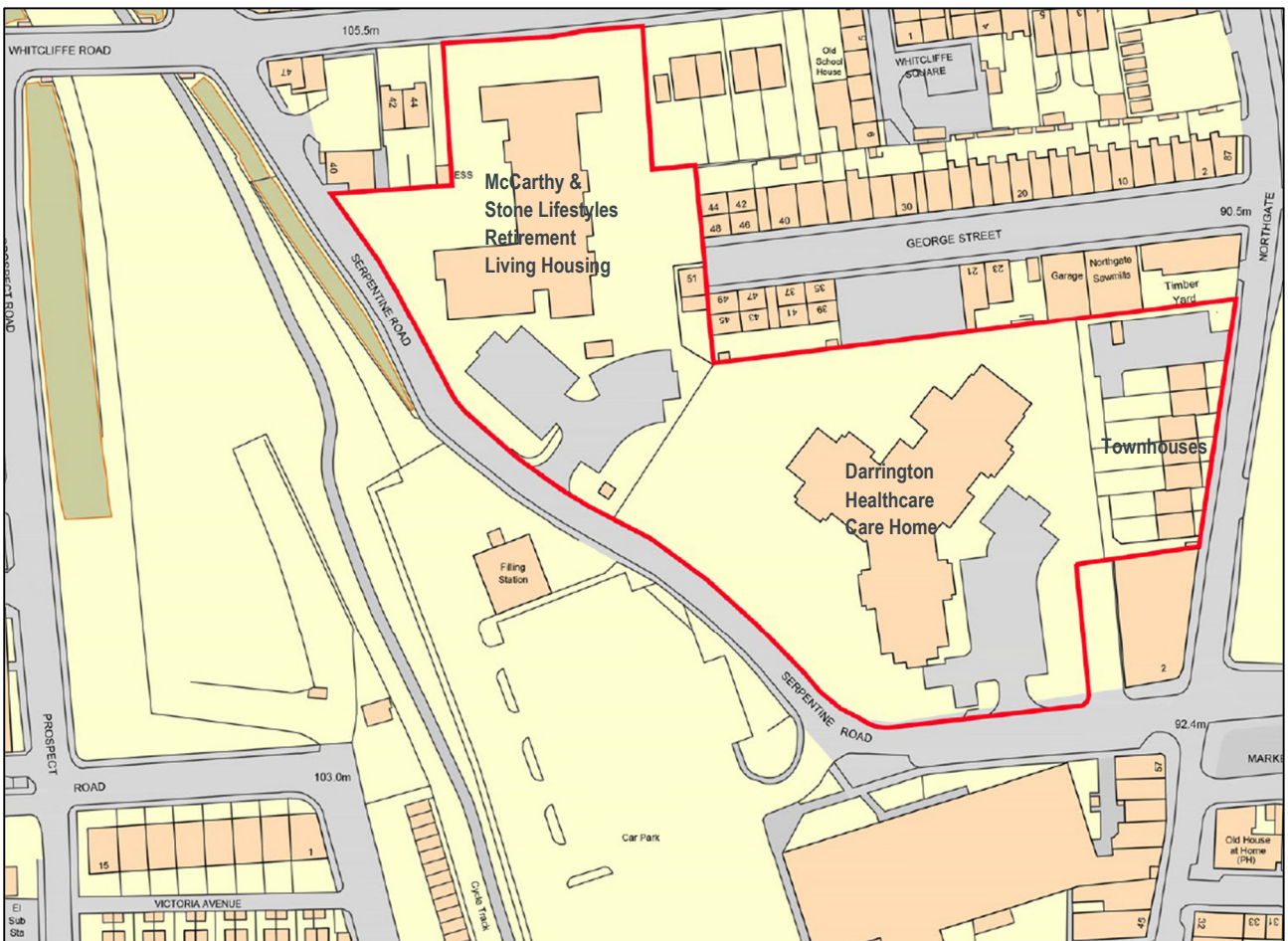
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## 1.0 Introduction

The site is in Cleckheaton and is bounded by Serpentine Road, Whitcliffe Road, George Street and Northgate. Currently, the site has a solid hoarding that encompasses the entire site as demolition works of the existing buildings have been completed. Figure 1 shows the red line boundary.

The purpose of this assessment is to determine the suitability of developing this land for residential development. The current proposal is for 7 new build town houses, retirement living housing with 43 individual apartments and a separate 83-bed care home.

**Figure 1 - The proposed development, red line boundary**



## 2.0 Noise Survey

We measured noise levels at key locations around the site to identify the main noise sources.

Figure 2 shows the locations used to measure noise levels affecting the site, with the data summarised in Table I.

**Figure 2 - Measurement locations across the site**



We set up a noise logger to measure continuously over a 24-hour period. The logger was positioned on the Serpentine Road boundary, opposite the entrance and exit of the Tesco Supermarket so that noise from vehicles coming and going could be captured.

We also did short term attended measurements at positions 1(a & b), 2 and 3 around the site. These positions were also representative of the nearest noise sensitive properties to the site.

The main source of noise affecting the site was road traffic on Serpentine Road, Northgate and Whitcliffe Road with only a few instances of intermittent traffic on George Street. There is also a commercial joinery operation on George Street (at Position A, above). We did short term measurements of intermittent activity at the joiners, which included the cutting of timber and vacuum extractors operating, though generally, observed activity was low during the survey.

The noise levels measured across the site are summarised in Table I.

**Table I – Summary of typical noise levels**

Position	Day (07:00 – 23:00)	Night (23:00 – 07:00)
1a/b (Northgate)	57-61 dB LAeq	52-54 dB LAeq 74 dB LAFmax <sup>1</sup>
2 (George St)	45-50 dB LAeq	44-47 dB LAeq 61 dB LAFmax <sup>1</sup>
3 (Whitcliffe Rd)	61-63 dB LAeq	42-63 dB LAeq 81 dB LAFmax <sup>1</sup>
Logger (Serpentine Rd)	58 dB LAeq,16hr	49 dB LAeq,8hr 68 dB LAFmax <sup>2</sup>
A (Joiners, when in operation)	61 dB LAeq 69dB LAFmax <sup>1</sup>	-

<sup>1</sup> highest measured maximum level

<sup>2</sup> typical maximum level

### 3.0 Criteria

#### 3.1 Internal Noise Levels

British Standard 8233: 2014 'Guidance on sound insulation and noise reduction for buildings', sets out suitable internal noise limits for habitable rooms in residential properties as follows:

**Table 2 - BS8233:2014 Criteria**

Activity	Room Type	Time Period	
		07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,T}$	-
Dining	Dining room/area	40 dB $L_{Aeq,T}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,T}$	30 dB $L_{Aeq,T}$

BS8233:2014 advises that individual noise events can cause sleep disturbance and suggests that a guideline value may be set in terms of  $L_{Amax}$ , depending on the character and number of events per night. We propose that individual noise events in bedrooms at night should not regularly exceed 45dB  $L_{AFmax}$ .

## 4.0 Noise Assessment

We have used the results of our survey to calculate noise levels within the proposed dwellings. Our calculations are based on typical room dimensions for the scheme (approx. 24m<sup>3</sup> for bedrooms and 36m<sup>3</sup> for living rooms) and glazing areas (approx. 1.3m<sup>2</sup> for bedrooms and 3m<sup>2</sup> for living rooms).

The external walls will be brick/block type construction. This build up will provide sufficient sound insulation to control noise break in. The chosen glazing will be the weakest part of the building envelope acoustically and therefore must be appropriately selected to meet the internal noise criteria.

### 4.1 Windows

External windows to the Retirement Housing, Care Home and Townhouses should achieve the minimum octave band sound reduction values below. With this provision, the BS8233 internal noise level criteria can be achieved.

**Table 3 - Minimum sound reduction index (SRI) of glazing to all living rooms and bedrooms**

Frequency Hz	63	125	250	500	1k	2k	4k
SRI, (dB)	16	20	19	29	38	36	45

This can typically be achieved by installing 6mm / 12mm / 6mm glazing or equivalent in suitable frames.

Opening skylights and external balcony doors must maintain this sound insulation and must be fitted with appropriate seals.

### 4.2 Ventilation

The Retirement Living Housing will be mechanically ventilated using MVHR units local to each apartment. Mechanical services noise limits are given below. These take into consideration the contribution of external noise through the facades with the windows proposed above.

- In bedrooms, mechanical ventilation noise levels must be less than 27dB(A), (approximately NR22)
- In living rooms, mechanical ventilation noise levels must be less than 32dB(A), (approximately NR27)

Specifications for suitable trickle ventilators for the town houses and Care Home are given below.

**Table 4 – Trickle Ventilator Specification**

Trickle Ventilator Specification	Example Solution
≥31 dB $D_{n,e,w}$ <sup>1</sup>	Standard non-acoustic trickle vent

<sup>1</sup> If more than 1 ventilator is used per room, the performance of each needs to be higher.

### 4.3 Noise from the Joinery Unit

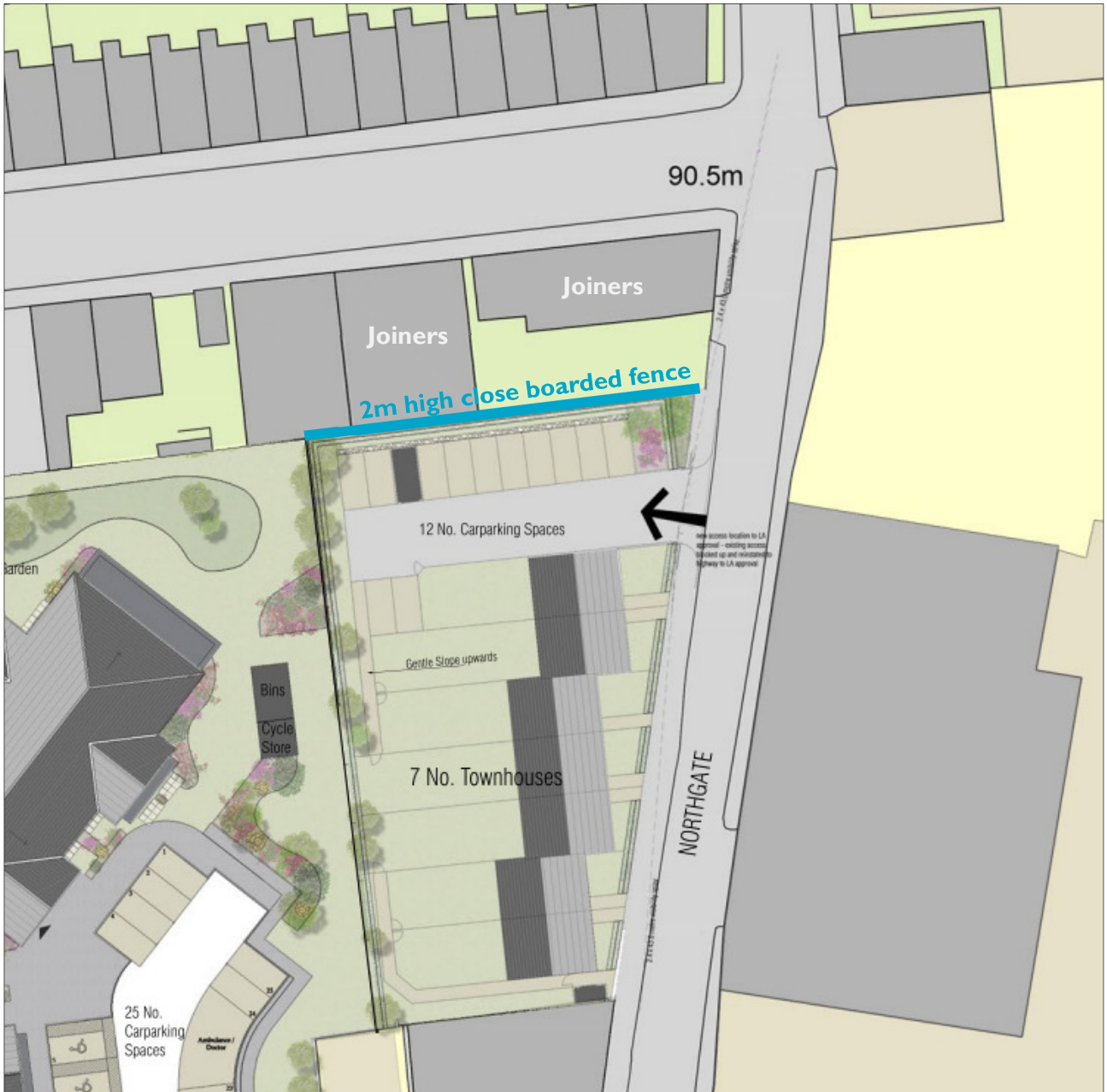
Activity at Cleckheaton Bespoke Joinery on George Street during the noise survey was low. A circular saw was the dominant noise source heard operating inside the unit and noise from the dust extract was audible close to the unit. Noise levels measured outside the unit on George Street were 61 dB  $L_{Aeq}$ .

On this basis, the windows and ventilator solutions (for the Townhouses) proposed above are suitable to protect against noise from this unit. However, given the nature of the operation, it is possible that there would be some occasional external activity in the yard to the rear, or higher noise levels when windows or doors are left open in summer.

To protect against this a close boarded fence at least 2m high should be erected along the boundary of the site to the Joinery unit, extending at least as far as the main joinery building, so that the exposed yard and any external plant or extract outlets are screened to the rear gardens of the proposed townhouses. This is illustrated in Figure 3 below.

In general, the layout of the townhouses is favourable to minimise disturbance from the Joiners as the houses are set back with parking in between. We recommend that there are no windows to habitable rooms on the gable end of the house facing the Joiners. A close boarded fence will also separate the gardens of the townhouses from the adjacent care home development, which will protect against noise from car park movements at the care home.

**Figure 3 – Extent of Fence to Adjacent Joiners**



## Appendix A - Survey Details

### A1. Location of Survey

Serpentine Road, Cleckheaton, BD19 3HU.

### A2. Date & Time of Survey

30 & 31 May 2017

13:00 - 17:00 and 23:00 - 00:00. 30 May 2017

07:00 - 08:00. 31 May 2017

### A3. Personnel Present During Survey

Claire Starley (SRL)

### A4. Weather Conditions during Survey

30 May 2017

Full cloud cover, faint wind (up to 3m/s), warm (approximately 16°C), damp roads but no surface water

31 May 2017

Clear sky, faint wind (up to 3m/s), mild (approximately 10°C), dry roads, no surface water

### A5. Instrumentation

All Instrumentation: Brüel & Kjær

Unattended Noise Logger

Type 2250 Sound Level Meter (SRL 2250 Orange, SRL N<sup>o</sup>: 516) (Serial N<sup>o</sup>: 2506736)

Type 4231 Calibrator (SRL N<sup>o</sup>: 517) (serial N<sup>o</sup>: 2528393)

Attended measurements

Type 2270 Sound Level Meter (SRL 2270 Black, SRL N°: 8513) (Serial N°: 2623080)

Type 4231 Calibrator (SRL N°:514) (Serial N°: 2665089)

## **A6. Calibration Procedure**

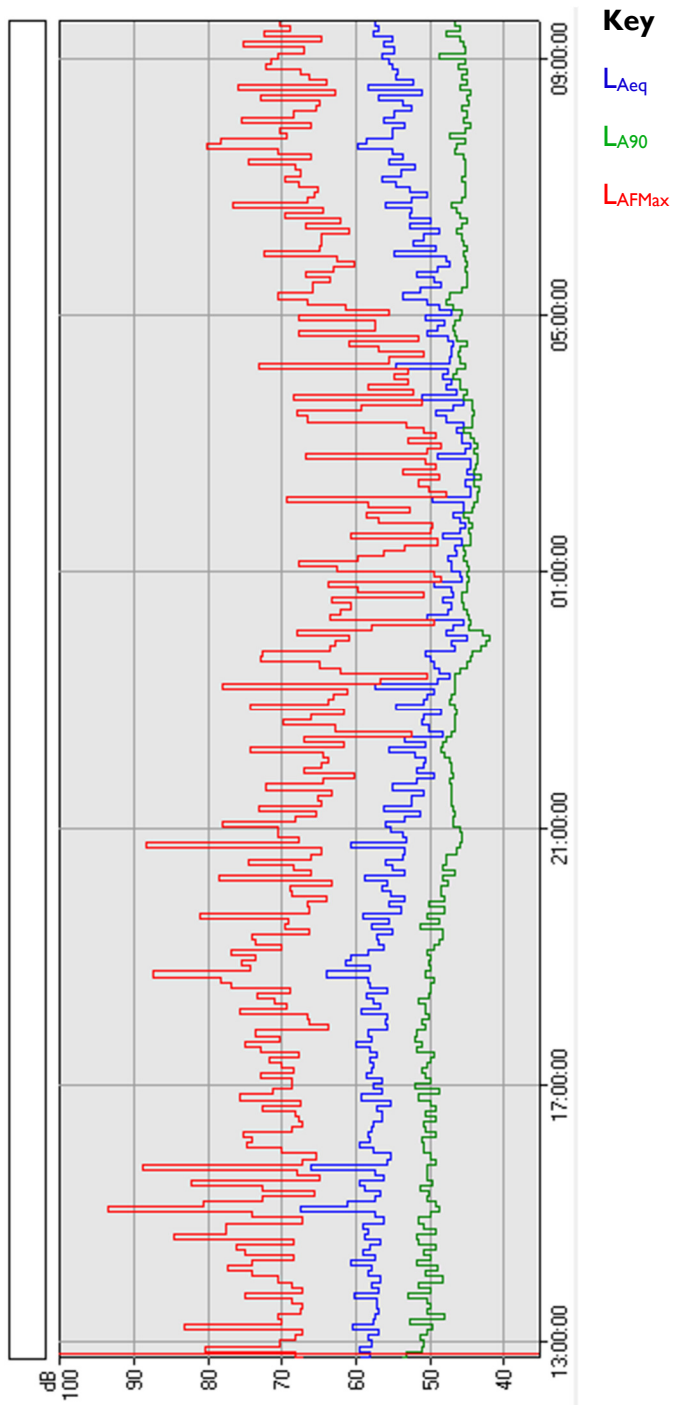
Before and after the survey the measurement apparatus was check calibrated to an accuracy of  $\pm 0.3$  dB using the type 4231 Sound Level Calibrators. The Calibrators produce a sound pressure level of 93.8 dB re  $2 \times 10^{-5}$  Pa at a frequency of 1 kHz.

## **A7. Survey Procedure**

Ambient noise levels were monitored at various positions around the site as shown on Figure 2. The measurements are tabulated in Section 3.0 of the report and a graphical display of the logger in Appendix B. Explanations of the parameters used are listed in Appendix C.

## Appendix B - Noise Logger Data

### Measured Ambient Noise Levels



## Appendix C - Tabulated Attended Noise Levels

**Table 7 - Summary of attended measurement during the daytime (Yellow dots, Figure 2)**

Position	Time (hh:mm)	Duration (Minutes)	L <sub>Aeq, T</sub> (dB)	L <sub>A90, T</sub> (dB)	L <sub>AFMax</sub> (dB)
1a	13:56	15	61	48	79
1a	14:52	15	59	48	78
1a	15:56	15	61	48	79
1a	07:48	10	57	42	80
2	13:32	15	50	45	71
2	14:35	15	48	46	63
2	15:36	15	49	46	65
2	07:10	10	45	40	62
3	14:14	15	63	46	82
3	15:15	15	61	48	78
3	16:28	15	63	49	79
3	07:28	10	62	43	81
A	16:47	4	61	60	69

**Table 8 - Summary of attended measurements during the night time (Yellow dots, Figure 2)**

<b>Position</b>	<b>Time (hh:mm)</b>	<b>L<sub>Aeq, 5mins</sub> (dB)</b>	<b>L<sub>A90, 5mins</sub> (dB)</b>	<b>L<sub>AFMax</sub> (dB)</b>
1a	23:07	50	45	67
1a	23:12	47	45	65
1b	06:45	54	42	74
1b	06:50	52	41	73
2	23:21	44	43	52
2	23:27	44	42	57
2	06:07	44	41	61
2	06:15	47	45	59
3	23:40	55	41	78
3	23:49	42	38	49
3	06:26	63	40	81
3	06:32	51	39	71

## Appendix D - Noise Measurements Parameter Definitions

$L_{Aeq}$  - The "A" weighted equivalent continuous sound pressure level. A representation of a continuous sound level containing the same amount of sound energy as the measured varying noise, over the measurement period. It can be considered as the "average" noise level.

$L_{A90}$  - The "A" weighted sound pressure level that is exceeded for 90% of the measurement period. It is commonly used as the "Background Noise Level".

$L_{AFMax}$  - The maximum "A" weighted sound pressure level during the measurement period.

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