

## Furthergate

Environmental Noise Survey Report  
06 March 2018



## Quality Management

<b>Job No</b>	CS094487-05		
<b>Project</b>	Furthergate		
<b>Location</b>	Manchester Office		
<b>Title</b>	Environmental Noise Survey Report		
<b>Client</b>	Blackburn with Darwen Council		
<b>Issued to</b>	Daniel Sutcliffe		
<b>Document Ref</b>	CS094487-05 R01	<b>Issue / Revision</b>	-
<b>File reference</b>	\\CSLPRBFS01\Data\Symonds\ACOUSTICS\CS094487-05 Furthergate noise survey\Working Documents\CS094487-05 R01 Furthergate - Environmental Noise Survey Report.docx		
<b>Date</b>	06 March 2018		
<b>Prepared by</b>	Jake Howarth AMIOA <i>Acoustic Consultant</i>	Signature (for file)	 Recoverable Signature  <hr/> Signed by: jake.howarth@capita.co.uk
<b>Checked by</b>	Paul Edwards MIOA <i>Associate Director (Acoustics &amp; Noise)</i>	Signature (for file)	 Recoverable Signature  <hr/> Signed by: paul.edwards3@capita.co.uk

## Revision Status / History

Rev	Date	Issue / Purpose/ Comment	Prepared	Checked
-	06/03/18	Initial issue	JH	PJE

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# 1. Introduction

Capita has been commissioned by Blackburn with Darwen Borough Council to carry out a pre-construction noise survey in relation to a proposed road scheme to join to Furthergate and the A6119 roundabout in Blackburn, Lancashire.

The environmental noise survey was undertaken at the site between 17:20 on 23 February 2018 and 16:35 on 26 February 2018 to determine the existing noise levels in the vicinity of the proposed scheme and to provide the basis of construction noise limits during the construction phase.

This report provides the measured noise levels taken in the vicinity of the site and compares these noise levels with the criteria set out in BS5228 in order to establish significance threshold noise levels prior to the construction works commencing on site.

## 2. Assessment criteria

The following criteria and guidance have been considered whilst undertaking this assessment.

### 2.1 Control of Pollution Act (HMSO, 1974)

The Control of Pollution Act (CoPA) gives local authorities powers to control noise or vibration pollution from construction sites, using primarily two mechanisms:

Section 60 enables a Local Authority to serve a notice specifying its noise or vibration control requirements with respect to steps to minimise noise and vibration that may include plant or machinery that may or may not to be used, limits on hours of working, and emission or reception limits on noise or vibration generated by the works.

Section 61 relates to prior consent, and provides a local authority and those responsible for construction works a means to agree in advance, the construction methods and the associated steps to minimise noise and vibration. A 'Section 61 consent' is in essence a Section 60 notice agreed between those responsible for the works and the local authority in advance of the works being undertaken.

In respect of both Section 60 and Section 61, it is acceptable that Best Practicable Means have been used to minimise noise (including vibration). Section 72 of CoPA presents the definition of Best Practicable Means, which is a mechanism for balancing noise and vibration levels with reasonably practicable mitigation.

### 2.2 Environmental Protection Act 1990 (EPA)

The EPA 1990 requires Councils to investigate noise disturbance and serve an abatement notice, under Section 80 of the Act, if the noise (including vibration) is considered to constitute a statutory nuisance. Section 82 of the Act also enables individuals to apply to a sheriff court and seek that an abatement notice is served. Defence against abatement action includes that Best Practicable Means is employed to minimise noise and, with respect to abatement action under Section 80 of the Act, that the works are being undertaken in accordance with the conditions imposed on a prior consent granted under the CoPA.

### 2.3 BS 5228: 2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites

Part 1 of this Standard provides recommendations for basic methods of noise and vibration control relating to construction and open sites where work activities/operations generate significant noise and/or vibration levels. The legislative background to noise and vibration control is described and recommendations are given regarding procedures for the establishment of effective liaison between developers, site operators and local authorities. This British Standard provides guidance on methods of predicting and measuring noise and assessing its impact on those exposed to it.

Part 2 of this Standard gives recommendations for basic methods of vibration control relating to construction and open sites where work activities / operations generate significant vibration levels. The Standard includes tables of vibration levels measured during piling operations throughout the UK. It provides guidance concerning methods of mitigating vibration from construction.

## 3. Noise survey

### 3.1 Site description

The site comprises a brown-field land located in Blackburn, Lancashire. The surrounding area is a mixture of industrial and residential premises with a haulage yard located to the east and houses located to the south and west. The north of the site is mainly grassland with some commercial premises present.

The scheme is to run a length of approximately 525 metres and connect Furthergate and the A678 roundabout. The route is indicated by the green outline in Figure 1.

The nearest noise sensitive premises to the proposed scheme are considered to be those located to along Burnley Road and Gorse Street indicated with the yellow outline in Figure 1

**Figure 1: Site location and measurement locations (image courtesy of Google Earth Pro)**



## 3.2 Noise survey details

Noise level measurements were undertaken by Jake Howarth AMIOA on the site using the equipment listed in Table 1, in the following locations and periods:

- Unattended continuous noise measurements were carried out between 17:20 on 23 February 2018 and 16:35 on 26 February 2018 at location 'L' indicated in Figure 1.
- Attended noise measurements were carried out over 2 x 15 minute periods on 26 February 2018 in positions 1 to 3 highlighted in Figure 1.

**Table 1: Noise survey equipment**

Location	Item	Manufacturer	Model	Serial Number
L	Sound level meter	Rion	NL-52	01121377
	Calibrator	Larson Davis	CAL200	1046
1,2 & 3	Sound level meter	NTi	XL2-TA	A2A-05380-E0
	Calibrator	Larson Davis	CAL200	9091

Measurement position 'L' was set up to the rear of the properties located on Burnley Road.

The sound level meter was set up to measure 15 minute sound pressure level measurements. The microphone was positioned close to a small tree, which contained no leaves and no thin branches that could influence the noise level measurements. The sound pressure levels measured in this location are considered to be free-field.

The attended noise measurements in positions 1, 2 and 3 were taken approximately 1.5 metres above ground level and at least 5 meters from any other reflecting surface. As such the noise levels measured in these locations are considered to be free-field.

## 3.3 Measured noise levels

### 3.3.1 Unattended noise measurements

The daytime and night-time noise levels for each assessment category period set out in BS5228 measured at position 'L' are given in Table 2 and Table 3.

The full dataset of noise measurements taken at Position 'L' is presented in Appendix B.

**Table 2: Measured noise levels in position 'L'**

Date	Measured Sound Pressure Levels (dB)		
	Day time (0700-1900) L <sub>Aeq,12hr</sub>	Evenings (1900-2300) L <sub>Aeq,4hr</sub>	Night-time (23:00-0700) L <sub>Aeq,8hr</sub>
Fri 23/02/18	52 <sup>1</sup>	49	43
Sat 24/02/18	52	49	44
Sun 25/02/18	51	48	46
Mon 26/02/18	57 <sup>1</sup>	-	-

<sup>1</sup>Measurement not made over full measurement period due to start and stop times

**Table 3: Measured noise levels in position 'L' – Weekend specific parameters**

Date	Measured Sound Pressure Levels (dB)		
	Day time (0700-1300) L <sub>Aeq,6hr</sub>	Day time (0700-2300) L <sub>Aeq,16hr</sub>	Day time (1300-2300) L <sub>Aeq,10hr</sub>
Sat 24/02/18	52	51	51
Sun 25/02/18	51	50	50

### 3.3.2 Attended measurement results

The sound pressure levels recorded during the attended measurements at Positions 1 to 3 are summarised in Table 4.

**Table 4: Summary of daytime manned noise measurements**

Position	Start time	Measured Sound Pressure Levels (dB)			
		L <sub>Aeq,15min</sub>	L <sub>AFmax,15min</sub>	L <sub>A90,15min</sub>	L <sub>A10,15min</sub>
1	14:47	53	63	51	54
	15:02	53	65	52	55
2	15:27	66	79	56	70
	15:42	68	90	56	71
3	16:02	55	66	52	57
	16:17	56	77	51	57

## 4. Construction Noise

### 4.1 Assessment criteria

Significance criteria for assessment of the effects of construction noise and vibration are based on guidance set out in BS 5228; these are set out within Table 5. The table below is used to establish the noise level at which significant effects will occur at residential dwellings.

**Table 5: BS 5228 significance criteria**

Assessment category and threshold value period ( $L_{Aeq}$ )	Threshold value, in decibels (dB)		
	Category A <sup>A</sup>	Category B <sup>B</sup>	Category C <sup>C</sup>
Night time (2300-0700)	45	50	55
Evening and weekends <sup>D</sup>	55	60	65
Daytime (0700-1900) and Saturday (0700-1300)	65	70	75
<sup>A</sup> Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.			
<sup>B</sup> Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.			
<sup>C</sup> Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.			
<sup>D</sup> 19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.			

### 4.2 Construction noise limits

Comparing the measured noise levels reported in Section 3.3 and the BS5228 threshold values given in Table 5, it can be seen that the site falls within Category A at all times, when the measured noise levels are rounded to the nearest 5 dB as per the guidance set out in BS5228. Therefore, the threshold values are given below:

**Table 6: Construction noise limits after which significant effects are deemed to occur**

Assessment category and threshold value period ( $L_{Aeq}$ )	Threshold value, in decibels (dB), after which significant effects are deemed to occur
Night time (2300-0700)	45
Evening and weekends (19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays)	55
Daytime (0700-1900) and Saturday (0700-1300)	65

## 5. Conclusion

Capita has been commissioned by Blackburn with Darwen Borough Council to carry out a pre-construction noise survey in relation to a proposed road scheme, which is to join Furthergate and the A678 roundabout in Blackburn, Lancashire.

The environmental noise survey was undertaken at the site between 17:20 on 23 February 2018 and 16:35 on 26 February 2018 to determine the existing noise levels in the vicinity of the proposed scheme and to provide the basis of construction noise limits during the construction phase.

Comparing the results of the environmental noise survey with the threshold values set out in BS5228, it can be seen that the site falls into Category A at all times. From this, appropriate construction noise limits have been set in line with the guidance in BS5228.

## Appendix A – Glossary of terms

### DECIBEL (dB)

The ratio of sound pressures which we can hear is a ratio of  $10^6:1$  (one million:one). For convenience, therefore, a logarithmic measurement scale is used. The resulting parameter is called the 'sound pressure level' ( $L_p$ ) and the associated measurement unit is the decibel (dB). As the decibel is a logarithmic ratio, the laws of logarithmic addition and subtraction apply.

### FREQUENCY

The repetition rate of a sound wave. The subjective equivalent in music is pitch. The unit of frequency is the Hertz (Hz), which is identical to cycles per second. A thousand hertz is often denoted kHz, e.g. 2 kHz = 2000 Hz. Human hearing ranges approximately from 20 Hz to 20 kHz. For design purposes, the octave bands between 63 Hz to 8 kHz are generally used. The most commonly used frequency bands are octave bands, in which the mid frequency of each band is twice that of the band below it.

### NOISE INDICES

Noise indices recorded during a survey that are of relevance to BB93 include the following:

$L_{Aeq,T}$  The A-weighted equivalent continuous sound pressure level over a period of time, T.

$L_{Amax,T(F,S)}$  The A-weighted maximum sound pressure level over period of time T, with fast or slow time weighting.

$L_{A1,T}$  The A-weighted sound pressure level exceeded for 1% of the measurement period, T. Indicative of the maximum noise levels.

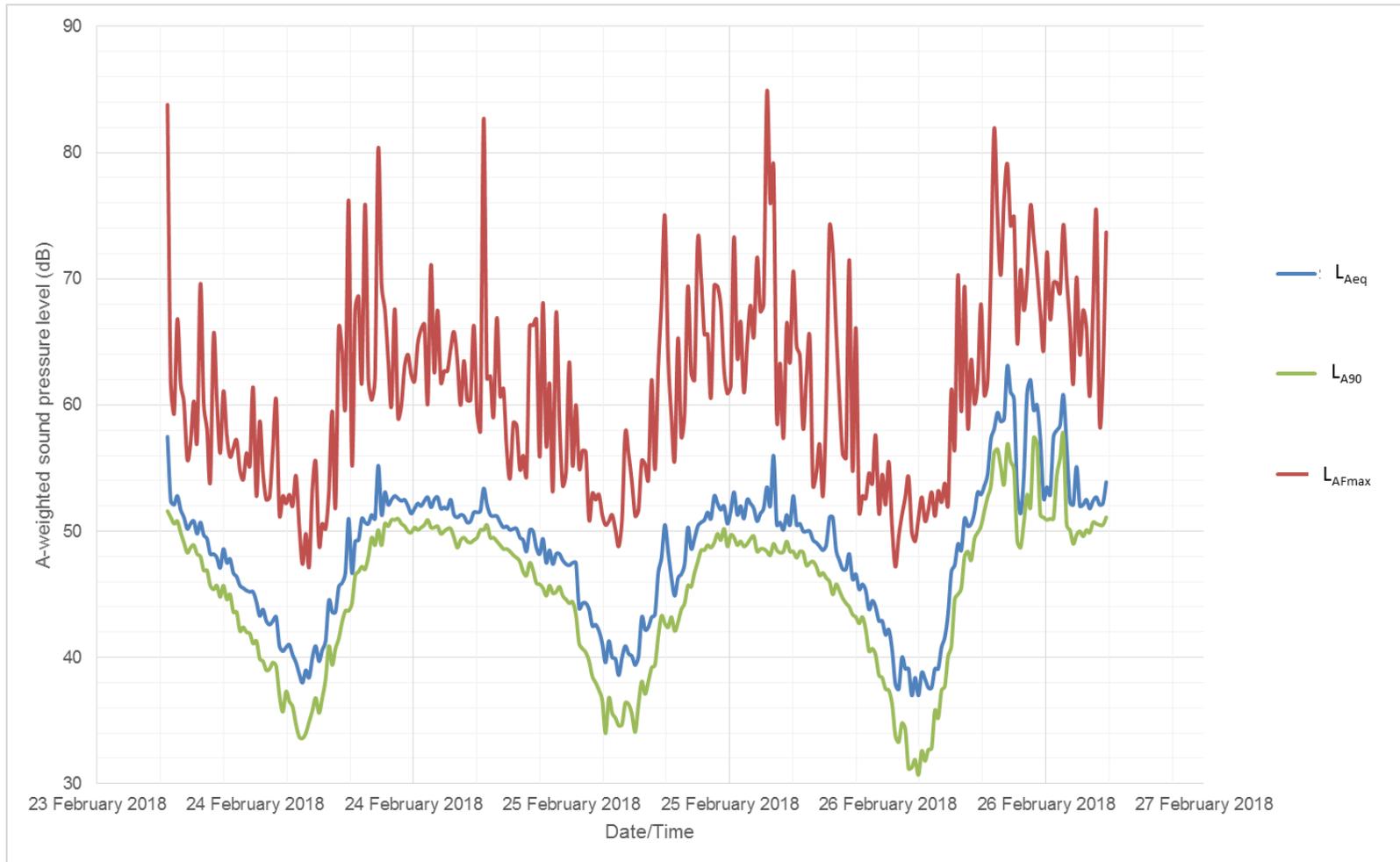
$L_{A10}$  The A-weighted sound pressure level exceeded for 10% of the measurement period, T.  $L_{A10}$  is the index generally adopted to assess traffic noise.

$L_{A90,T}$  The A-weighted sound pressure level exceeded for 90% of the measurement period, T.  $L_{A90}$  is widely accepted as indicative of the background noise level.

Sound pressure level measurements are normally taken with an A-weighting (denoted by a subscript 'A', e.g.  $L_{A90}$ ) to approximate the frequency response of the human ear.

## Appendix B – Continuous noise monitoring data

Figure 2 Results from unattended position A



**Capita Property and Infrastructure Ltd**

8th Floor  
The Observatory  
Chapel Walks  
Manchester M2 1HL

Tel +44 (0)161 819 4200  
Fax+44 (0)161 819 4201